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# Performance of personal pension funds in the United Kingdom

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# PERFORMANCE OF PERSONAL PENSION FUNDS
# IN THE UNITED KINGDOM

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## ABSTRACT


The pension fund industry affects an enormous proportion of the world population and consists of more than $20 trillion of assets globally. Hence the performance of pension funds has major effects. This thesis investigates the performance of personal pension funds in the UK, one of the leading pension industries in the world. It identifies two important factors that are largely overlooked in the related literature: fund's age and management outsourcing. Based on the 'career concerns' argument by Holmström (1999), it tests whether fund performance is age dependent, and in particular, whether funds perform better when they are young than when they 'mature'. Moreover, one of the major features of the pension fund industry has been the enormous growth in management outsourcing. This thesis addresses this issue and tests whether there are differences in the performance between outsourced and internally managed funds, and investigates potential determinants of the decision to outsource. It argues that a 'fashion to outsource' may be partially responsible for the trend.

Given that a CAPM-APT based analysis is not appropriate for the data at hand, the thesis employs three alternative performance measures, two of which utilise fund-specific benchmarks. The results show that risk-adjusted returns are statistically insignificantly different from zero but funds significantly outperform their benchmarks. Performance is found to change with fund's age but this relationship is more complex than a simple 'career-concern' argument would predict. Risk-adjusted returns of the internally managed and the outsourced funds are both indifferent from zero but the outsourced funds are better at outperforming their benchmarks. Lastly, there is some evidence of a 'fashion to outsource'.

This research is novel in several ways. It provides the first detailed investigation of the performance of the UK personal pension funds. It is the first to address the question of potential factors (other than managerial characteristics) that may explain fund performance. It discusses the rise of outsourcing in the industry and analyses differences/similarities between performance of the outsourced and the internal funds. Finally, it is the first to investigate whether the rapid increase in outsourcing is due to 'fashion'.

# CHAPTER 1: INTRODUCTION

There is undisputed evidence that the world population is ageing. The median age in the OECD area is projected to increase to 46 years in 2050 (compared to 30 in 1970) by which time there will be two pensioners for every worker.[1] This is expected to have an immense effect on public finances and as a result, a worldwide wave of pension reform was triggered. The World Bank, one of the most vocal proponents for reform, has advocated the replacement of the unsustainable Pay-As-You-Go state pensions with a multipillar funded pension system and spent an astounding $13.2 billion in the years 2002-2007 supporting reform in 56 countries. Unsurprisingly, the reform in many countries followed the Bank's model by introducing funded occupational and personal pensions. Through this change pension funds have emerged as a powerful institutional investor accumulating assets of more than $19 trillion in 2010 in the OECD area alone. As a consequence, pension funds are able to support economic growth, improve corporate governance, and promote financial development particularly in emerging economies.

However, a new trend has emerged following this 'first' wave of reform, namely a change in the structure of pension benefits. Most types of funded pensions had been set up with a defined benefit (DB) structure according to which pension benefits are predetermined and independent of investment performance of pension funds. The new trend is a shift toward defined contribution (DC) benefits where pension benefits depend on fund's performance. Although this may seem only a subtler change, it is decisive for the pension income and, therefore, for the suitability of the funded sector to replace state pensions.

Since this shift from DB to DC is relatively recent there is still very little evidence whether DC pension funds are up to the challenge. First reports coming from the US indicate that this is not the case. DC plans are found to be rather inadequate to replace income at retirement. In view of the widespread change toward DC pensions this is disquieting particularly as there are very few studies on DC funds' performance.

[1] Own calculations using data from the "World Population Prospects: The 2008 Revision", United Nations.

The main purpose of this thesis is to address this gap in our knowledge. In order to do so, it identifies the UK personal pension sector as an exemplary case of a DC system. The British personal pension sector has a relatively long history, which allows a meaningful analysis of the past DC funds' performance. Indeed, the UK is distinctive as it is one of the countries where pension reform has been introduced much earlier than in the rest of Europe. As a result its funded pension sector is one of the largest worldwide (in terms of assets) and has become more important than the state for pension provision. Therefore, studying the British industry provides a unique and valuable lesson on the characteristics and performance of DC funds.

Although much of the development of the UK pension industry is due to the early reforms of the Thatcher government in the 1980s, an overview of the regulatory change shows that funded occupational pensions have a very long tradition in the UK going back to the 18th century. Personal pensions are more recent, initially organised for the self-employed in the 1950s and then introduced as an alternative pension arrangement for everyone in the 1980s. Occupational pensions have been traditionally DB but employers have been gradually replacing them with DC schemes. However, the most important change came from the Brown government in 2008 that introduced the 'personal accounts' that have been rebranded as 'National Employment Savings Trust' (NEST) accounts and are available from 2012. What is characteristic for these accounts is that they are DC and thus, they may significantly increase the number of employees that are covered by such schemes (there is some recent evidence that people opt out of these schemes finding them unattractive). This stresses even more the need to study the performance of personal pensions that are DC by definition.

The primary objective of this thesis is exactly this, i.e. it studies the performance of the UK personal pension funds. This is made possible by the creation of a new database by Morningstar Direct™ which was launched in 2008. The thesis makes use of monthly fund returns from January 1980 till December 2009 as well as information on the funds' providers, their investment style, and management type for almost all funds. Downloading and organising the data was a very time-consuming and labour intensive task. It took over a year to complete it as it required a manual collection of additional information on pension providers and fund-specific benchmarks.

There are two principal foci in this thesis. The first one is the relationship between fund performance and fund's age. Generally, previous research on performance has indicated that managers of mutual and pension funds do not outperform given benchmarks. There is also evidence for short-term performance persistence and some selection skills but the results also show that managers cannot time the market. Moreover, researchers have examined whether factors such as manager and fund family characteristics can affect fund returns. Among these approaches in fund performance assessment fund's age has received very little attention. However, this thesis hypothesizes that fund performance changes with fund's age. The reasons lie within agency theory and particularly in the work of Fama (1980) and Holmström (1999). Fama argues that reputational concerns can work as managerial incentives particularly if little is known on managerial ability. This idea is formalised by Holmström (1999) who presents a model where managers are incentivised to work hard at the beginning of their career in order to signal their ability and as the market learns about it new information becomes less valuable, and so there are fewer incentives to work hard. The theory that information loses its value the more of it is available is the premise of the first hypothesis in this thesis. If this theory is applied to fund's age it should be expected that when there is little information on young funds any performance news is important. As a result, managers will try hard to present the best possible picture in order to attract contributors and as the funds become older there is less need for managers to do so. Although managerial effort is unobservable it can be approximated by fund performance and assuming that effort changes with fund's age, fund performance is expected to change with fund's age as well.

The second focus of this thesis is the increasing use of outsourcing the fund management of personal pension funds in the UK. It is reported that fund management outsourcing has boomed in recent years in the US mutual fund and Dutch pension fund industries. A similar development is observed in the UK personal pension industry where within a decade outsourcing has become the prevailing management practice. The proportion of funds being outsourced in the market was only 8% in 1980 and gradually increased to 18% in 2000. However, by the end of 2009 this proportion had increased to almost 60%. Despite this development there is very little evidence on the effect this has had on fund performance. Research on US mutual funds has indicated that outsourced funds underperform those that are run in-house. Assuming that competition will eliminate either type of management in case of persistent underperformance, the second hypothesis in the thesis is that there is no difference between the performances of internally and externally managed UK personal pension funds. Moreover, it is expected that the performance of both management types changes with fund's age since internal managers need to attract contributors for young funds and external managers more clients-providers.

Furthermore, this thesis studies what are the possible reasons for this outsourcing boom. Related research has identified a number of factors but has neglected the possibility that outsourcing has simply become a 'fashion' although there is anecdotal evidence to this effect. The third hypothesis in the thesis is that fashion is at least one of the drivers behind this ever growing trend to outsource management in the UK personal pension industry.

In the process of addressing the three stated hypotheses, a number of methodological issues arise. The most important relates to the way fund performance is assessed. It is argued for the particular sample that a CAPM or APT based analysis is not appropriate and thus, alternative performance measures are applied. Moreover, the question of benchmark selection is solved by adopting fund-specific benchmarks as provided by the Morningstar database, but as the analysis will show there are questions on how these benchmarks are selected in the first place. Finally, several control variables are created based on related literature and analysis shows that indeed, they have explanatory power over fund performance.

The thesis is structured as follows. Chapter 2 describes the background of the thesis. The first part discusses pension reform and the shift from DB to DC. The second part explains in detail why the UK is a special case and poses a valuable case study. The chapter concludes with a description of the dataset and an overview of the subsequent analysis. Chapter 3 addresses the first focus of the thesis, i.e. the relationship between fund performance and fund's age. It starts with a literature review on fund performance and argues why fund's age is important. The second part dwells on the methodological issues that evolve around performance measurement and benchmark selection. Much of the methodology from this chapter is also applied in Chapter 4. The third part describes the regression analysis which includes the identification of the explanatory variables as well as the presentation and interpretation of the results. The chapter concludes with a discussion of the main results, limitations, and contributions and points out directions for future research. Chapter 4 examines the relationship between fund performance and outsourcing. It opens with a literature review and continues with a description of the development of external management in the UK personal pension industry. The regression analysis follows with a presentation and discussion of the results. The final part summarises the main points that emerge from the analysis, discusses its contributions and limitations, and proposes points for further research. Chapter 5 investigates the determinants of the outsourcing boom and posits that 'fashion' may have been one of them. The first part discusses related literature and states the hypothesis. The second part discusses the methodological issues in measuring the factors that are identified as possible determinants of outsourcing. The last part describes and interprets the results of regression analysis. The chapter concludes again with a discussion of the main results, the contributions and limitations of the analysis and suggests objectives for future research. The thesis concludes with a brief summary of the main results.

# CHAPTER 2: BACKGROUND AND DATA

This chapter describes the context of this thesis and positions it within related research. It contains three subsections. The first subsection sets out the general background and defines the main issue that is addressed in the thesis. The second subsection explains the motivation for choosing the particular industry and country as means of addressing this issue. Finally, the last subsection describes the dataset which enables the analysis of the chosen industry. The chapter concludes with a brief statement of the main objectives of this thesis.

## 2.1. Background

There is already substantial evidence that the world is ageing. According to United Nations data the average median age in the OECD area is projected to reach 46.2 years by 2050. At the same time, there is an observable shift in the balance between pensioners and working population. A measure that captures this shift is the old-age dependency ratio which shows approximately how many people of pensionable age there are for every hundred workers.[2] The average old-age dependency ratio in the OECD area is expected to double in the next forty years and reach almost 47% by 2050 which means having roughly one pensioner for every two workers.[3] Interestingly, both developed and developing countries face this demographic change which is expected to have multiple effects in their economies (Davis, 2002a).

There is extensive research documenting the possible effects ageing population may have on both financial markets (e.g. Schieber and Shoven, 1994; Turner et al., 1998; Poterba, 2004) and public finances (e.g. Hagemann and Nicoletti, 1989; Roseveare et al., 1996). Particularly the latter has been the subject of intensive discussion as state pensions worldwide have been operating on a PAYGO basis. This means that workers' pension contributions are channelled into payments for pensioners' state pensions, thus making unfunded pension systems financially unsustainable in the long-run.

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[2] The United Nations calculate the old-age dependency ratio as the number of people aged 65+ divided by the number of people aged 15-64.
[3] Own calculations using United Nations population projection data.

The expected strain on public finances has triggered an international wave of pension reform introducing pension funds and promoting private pension provision which has been strongly advocated by the World Bank. Indeed, the Bank has been one of the leading organisations promoting funded pension systems by engaging in a wide range of activities from research funding to technical assistance since the early 1980s.[4]

In the period between 1984 and 2001 the World Bank approved 154 loans to several countries planning pension reforms which amounted to $5.5 billion. The purpose of the loans was primarily to cover the transition costs after a major pension reform. In the financial years between 2002 and 2007 alone it financed 112 pension-related projects in 56 countries. The amount loaned reached $13.2 billion, which accounted for 10.3% of total World Bank lending in the same period.

The primary goal of these loans has been to support mainly developing economies with their pension reform efforts. At the same time, developed, high-income countries have been reforming their pension systems as well. According to the OECD all G10 countries have introduced minor or major reforms since the 1980s. [5]

Despite criticism of the Bank's recommendations (e.g., Singh, 1996; Kotlikoff, 1999) most undertaken reforms, at least in the OECD area, seem to closely follow the World Bank's funded, multipillar model (Schwarz and Demirguc-Kunt, 1999). Many countries have been compelled to create funded systems in order to protect the financial solvency of their public pension provision (Bonoli, 2003) and in the case of the transition economies of Eastern Europe (Impavido, 1997) and Latin American countries (Roldos, 2007) there have been high expectations that a funded system would also help develop the financial sector.

Numerous papers stress the importance of the creation of a funded pension industry for economic development and shaping the financial sector.  It has been argued that pension fund

[4] "Pension Lending and Analytical Work at the World Bank: FY2002-07", The World Bank, 2008.
[5] The Group of Ten (G10) countries are Belgium, Canada, France, Germany, Italy, Japan, The Netherlands, Sweden, Switzerland, the United Kingdom, and the United States. OECD Financial Market Trends, "Ageing and Pension System Reform: Implications for Financial Markets and Economic Policies", November 2005.

growth can affect financial markets in several different ways (Blommestein, 2001). Indeed, there is evidence that pension funds can encourage capital market modernisation and financial innovation (Bodie, 1990; Vittas, 1996) but also impact on asset prices and returns (Gompers and Metrick, 2001; Boyer and Zheng, 2002). Furthermore, empirical evidence supports the connection between pension fund assets and stock market growth, however, the direction of causality remains ambiguous (e.g. Catalan et al., 2000; Harichandra and Thangavelu, 2004).

Overall, research indicates a positive relationship between pension fund growth and capital market development, in terms of both financial innovation and stock market growth. Moreover, there is evidence that stock market and economic growth are positively correlated (Demirguc-Kunt and Levine, 1995; Calderon and Liu, 2003; Beck and Levine 2004; Claessens et al., 2006). Thus, pension funds can contribute to economic growth through their positive impact on the financial markets' development.

The above empirical evidence is based on studies of developed markets and mainly the United States. Nonetheless, research seems to support the connection between pension funds and financial market growth for emerging markets as well. Research has shown that pension reform can lead to stock market growth through asset accumulation (Roldos, 2004) although there is no indication that it could happen through better governance practices due to pension fund activism (Catalan, 2004). There is also indication that savings accumulation after pension reform is beneficial for worker productivity (Davis and Hu, 2004) and for economic growth, especially for emerging countries with more macroeconomic stability (Walker and Lefort, 2002).

Interestingly, a cross-effect between pension funds' size in developed countries and stock markets in developing countries does not appear. On the contrary, empirical research has shown that institutional investors' cash flows may negatively affect the development of emerging stock markets and big investors may destabilise emerging markets (Aitken, 1998; Frenkel and Menkhoff, 2004; Chan-Lau, 2005; Zalewska, 2006).

Apart from the overall positive effect pension fund growth can have on capital markets and economic development, research has shown that there is also another subtler change. The emergence of pension funds as large shareholders is argued to have improved corporate governance (Davis, 2002b; Catalan, 2004). Particularly due to their size they are considered to be more successful in their activism than individuals (Gillan and Starks, 2000). Indeed, there is evidence that pension funds are strong vocal activists (Woidtke, 2002), however, the benefits of this activism on adding firm value are not confirmed by empirical results (Romano, 1993; Wahal, 1996; Faccio and Lasfer, 2000). Nevertheless, as active investors pension funds are generally found to influence corporate strategy and operations by promoting innovation (Hoskisson et al., 2002), international diversification (Tihanyi et al., 2003), and social performance (Johnson and Greening, 1999; Cox et al., 2004).

On the whole, research indicates that the creation of funded pension systems has been beneficial for world economies in several aspects. In this respect, this wave of pension reform may be deemed an improvement. However, with time some features of the funded system have been revisited, and particularly the structure of pension benefits. The above literature concentrates on occupational funded pensions whose benefit structure has been almost to its entirety defined benefit (DB). This means that the pension benefits are predetermined and depend only on the amount of contributions paid into the pension fund. If the fund is in surplus at the time of retirement, due to good investment performance, the employee receives the predetermined pension and the employer keeps the surplus. In case the fund is in deficit due to bad performance then the employee will still receive the predetermined pension but the employer has to cover the deficit. Thus, the employer carries the risk of low investment returns. The main alternative benefit structure is defined contribution (DC) where the employee's pension depends not only on the contributions made but also on the fund's investment performance. In case of poor investment returns the pension benefits are adjusted correspondingly downwards and so the employee carries the investment risk.

After the initial wave of reform which had introduced funded pensions followed a second wave of reform which has been reshaping the overall funded sector from DB into a DC structure. This ranges from changing unfunded state pensions into notional personal account DC systems as in Italy and Sweden (Börsch-Supan, 2005) to shifting the occupational pension benefit structure from DB to DC (Kruse, 1995; Ross and Wills, 2002; Broadbent et al., 2006; Whiteford and Whitehouse, 2006), and to introducing new forms of personal DC pensions (Even and MacPherson, 1994; Ippolito 1995).

Researchers have discussed in detail possible reasons for this shift. In the case of occupational pensions, the DB structure has been getting more expensive for employers due to increased longevity of their retired employees and volatile stock markets (Ross and Wills, 2002; Aaronson and Coronado; 2005; Banks et al., 2005). Furthermore, regulatory change has made DB plans costlier to administer (Kruse, 1995; Brown and Liu, 2001; Ross and Wills, 2002). At the same time, increases in workforce mobility have made portable pension schemes more desirable than the classic DB plan which requires staying with the same employer till retirement (Bodie et al., 1988; Aaronson and Coronado, 2005).

This DB to DC shift in the funded pension system has several implications for plan members. The main advantages are increased pension scheme portability and lower dependency on the employer. The main disadvantage is that members bear the entire investment risk (Bodie et al., 1988; Banks et al., 2005; Broadbent et al., 2006). It has been argued that this disadvantage is counterbalanced by the fact that DC members have the right to engage actively in the asset allocation of their fund's portfolio (Broadbent et al., 2006). However, evidence suggests that members do not receive enough information and even if they are well informed they are not likely to become involved in the fund's investment strategy (Ross and Wills, 2002; van Rooij et al., 2007).

Despite the general discussion on the causes and implications of this major shift there is very little information on the performance of DC schemes. Simulation analyses have indicated that although DC schemes may provide on average higher benefits than DB schemes (Samwick and Skinner, 2004) they are likely to disadvantage low-income groups or members with discontinued working patterns (Even and MacPherson, 2007; Poterba et al., 2007). Researchers have also applied simulation analysis to predict whether DC schemes can generate a retirement income that is comparable to the income while in employment. The results are mixed with some results predicting an 'adequate' retirement income (Brady, 2012) to others being rather low (Cannon and Tonks, 2009).

Apart from the simulation analyses there is very little empirical evidence on how DC plans have been performing. The first indications from the personal DC pension schemes in the USA is that they underperform DB plans (Munnell et al., 2006) and generate income that can hardly cover 25% of the income enjoyed in employment (Browning, 2011). Considering that the whole funded pension system is being restructured towards DC in many countries around the world, this rather alarming news. This thesis will address this gap by investigating the personal pension industry in the UK which has been DC from its inception and is old enough to allow a meaningful analysis of its performance.

## 2.2. The funded pension sector in the UK

The funded pension sector in the United Kingdom poses a special case in Europe and worldwide. The UK has been promoting the development of the private sector for pension provision from early on even though it has one of the least dismal population ageing projections.[6] According to Blake (2003b), in the early 1980s, the conservative government under Margaret Thatcher was the first among developed countries to deal with the possibility of a state pension crisis. It was also among the first to introduce funded pension schemes and limit the role of the unfunded PAYGO system. Personal pensions, in particular, took an organized and regulated form in the late 1980s. At that time most countries, especially in Europe, had not started reforming yet.

The reforms of the Thatcher government have made several key contributions into shaping the UK pension system. First, they set up a regulatory authority for the occupational pension sector making it more reliable and trustworthy. Second, they introduced the option of making lower contributions for state pension if an employee was covered by an appropriate private scheme, thus, presenting private pension provision as a clear substitute for state pension. Third, they established the personal pension sector, which was the first organised form of private pension provision in the UK that was independent of an employer. The latter enabled employees to withdraw from their occupational schemes and opt for another form of private pension.

[6] The UK has a 2050-projected old-age dependency ratio of 38% compared to the OECD-average of 46.8%. Own calculations based on United Nations population projection data.

There were considerable defects however, such as a lack of control over the conditions under which employees made the change from occupational to personal pension provision, and absence of restrictions on charges imposed by personal plan providers. These led to the mis-selling scandal in 1993 and to personal pension schemes that were not widely affordable.[7]

Nonetheless, these reforms created the foundation of private pensions in the UK and although, the later Labour government under Tony Blair focused more on resources redistribution, it continued with the task of promoting private pension provision. The probably most important input has been the introduction of stakeholder plans as a more affordable alternative to the personal pension plans contrary to other countries having a third pillar “aimed at catering for the needs of more sophisticated investors” (Impavido, 1997).

This relatively early promotion of private pension provision is what has made the UK a case study of pension fund success with high levels of employee coverage and accumulated assets (Davis, 2001). In terms of coverage, almost 60% of the working population was covered by a private pension in 2007.[8] In terms of accumulated assets under management, private pension assets in the UK had reached $1.9 trillion in 2010. To illustrate how this compares against the other OECD countries Table 2.1 documents the size of accumulated pension fund assets in 2010.

In terms of pension fund assets, the UK has by far the largest private pension sector among the European country members of the OECD. The Netherlands that come second in Europe have almost half of the assets of the UK, and Switzerland in the third place, has less than one third.

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[7] Blake (2003a) reports how personal pension providers used aggressive sale techniques and persuaded 500,000 employees between 1988 and 1993 to switch over to personal schemes. The majority would have received a more generous pension had they stayed in the occupational scheme. He mentions that “as many as 90% of those who transferred had been given inappropriate advice”.

[8] See Figure 2.4.

Table 2.1. Total pension fund assets in the OECD countries, 2010 (measured in USD trillion). *Source: Pension Markets in Focus 2011 – OECD.*

| **Country** | **Pension Fund Assets** (in USD trillion) |
|---|---|
| United States | 10.59 |
| **United Kingdom** | **1.94** |
| Japan | 1.39 |
| Australia | 1.09 |
| Netherlands | 1.06 |
| Canada | 1.02 |
| Switzerland | 0.55 |
| Finland | 0.20 |
| Other OECD | 1.35 |
| **Total OECD** | **19.18** |

However, when the size of the economy is taken into account, countries with mandatory private pension systems are ahead of the UK. Table 2.2 lists the pension fund assets as a percentage of the GDP in OECD countries in descending order.

The UK is the third largest in Europe after the Netherlands and Iceland. Of these two countries, Iceland has a mandatory occupational pension system, whereas the Netherlands have established collective, industry-wide agreements that extend coverage to more than 75% of the working population.

Nevertheless, what the UK system has achieved is to develop such a large private sector without making contributions to it mandatory, something that the World Bank has strongly advocated. This implies that in relation to the economy, the UK has the largest voluntary pension system in Europe.

Table 2.2. Total pension fund assets as a percentage of GDP in the OECD countries, 2010. Shows how many assets have been accumulated in private pension systems in the OECD area relative to GDP. Measured in %. *Source: Pension Markets in Focus 2011 – OECD.*

| **Country** | **Pension Fund Assets** (% of GDP) |
|---|---|
| Netherlands | 134.89 |
| Iceland | 123.91 |
| Australia | 90.95 |
| **United Kingdom** | **86.55** |
| Finland | 82.12 |
| United States | 72.61 |
| **Weighted average** | **71.62** |
| Chile | 66.97 |
| Canada | 60.93 |
| Denmark | 49.71 |
| Ireland | 49.05 |
| Israel | 48.95 |
| Japan | 25.25 |
| Poland | 15.79 |
| Hungary | 14.62 |
| New Zealand | 13.80 |
| Mexico | 12.58 |
| Portugal | 11.43 |
| Spain | 7.90 |
| Norway | 7.75 |
| Slovak Republic | 7.41 |
| Estonia | 7.38 |
| Czech Republic | 6.33 |
| Austria | 5.25 |
| Germany | 5.18 |
| Italy | 4.57 |
| Korea | 3.96 |
| Belgium | 3.77 |
| Slovenia | 2.49 |
| Turkey | 2.35 |
| France | 0.18 |
| Greece | 0.02 |

The advanced level of private pension provision in the UK is also reflected in the relatively low replacement rate. The OECD reports two kinds of rates:

-*gross replacement rate*: the ratio of gross pension entitlement divided by gross pre-retirement earnings.

-*net replacement rate*: the ratio of individual net pension entitlement divided by net pre-retirement earnings. Personal income taxes and social security contributions are taken into account.[9]

Therefore, a replacement rate measures in effect to what extent the projected income in retirement will "replace" the income enjoyed during employment. To estimate the income in retirement, OECD takes into account all mandatory sources of pension. These normally include the state pension (since contributions to it are mandatory in all OECD countries) and any private pension if there is compulsory participation in either occupational or personal schemes. Figures 2.1 and 2.2 show the gross and net replacement rates in the OECD countries for a worker of average earnings.

The UK has the lowest gross replacement rate for an average earner in OECD at 30.8%. This implies that the expected state pension (which is the only mandatory source of retirement income) will be only 30.8% of the income earned during employment. Should an employee wish to keep the same income level in retirement as the one enjoyed while employed, more than two thirds of it can be provided solely by the private sector.

In terms of net replacement rate, the UK has the fourth lowest in OECD at 40.9%, meaning more than half of net retirement income can only by covered by private pension in order to retain the same net income level received in employment.

[9] The definitions are taken from the publication "Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries - OECD © 2009 - ISBN 9789264060715".

Figure 2.1. Gross pension replacement rates for an average earner in OECD countries. The rates reported refer to men workers and are the same for women in all countries except Italy (women replacement rate is 52.8%), Mexico (29.9%), Poland (44.5%), and Switzerland (59%). Measured in per cent. *Source: Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries - OECD © 2009*.

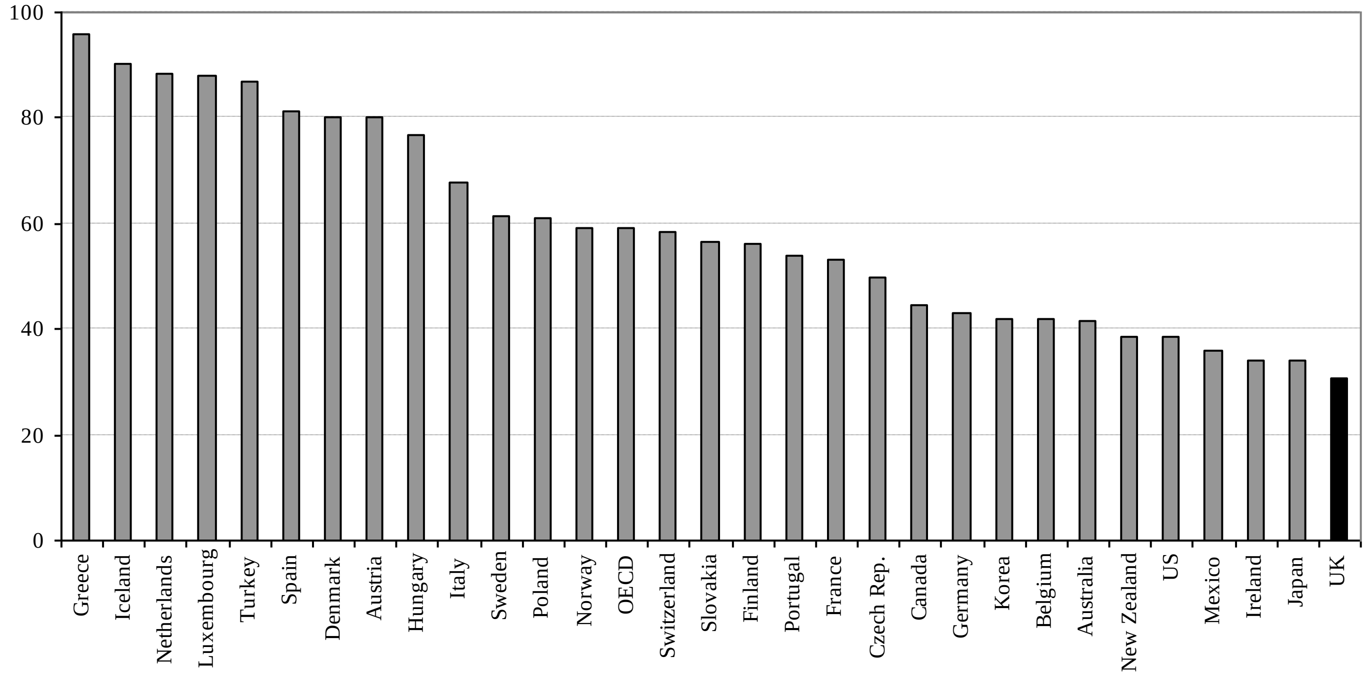
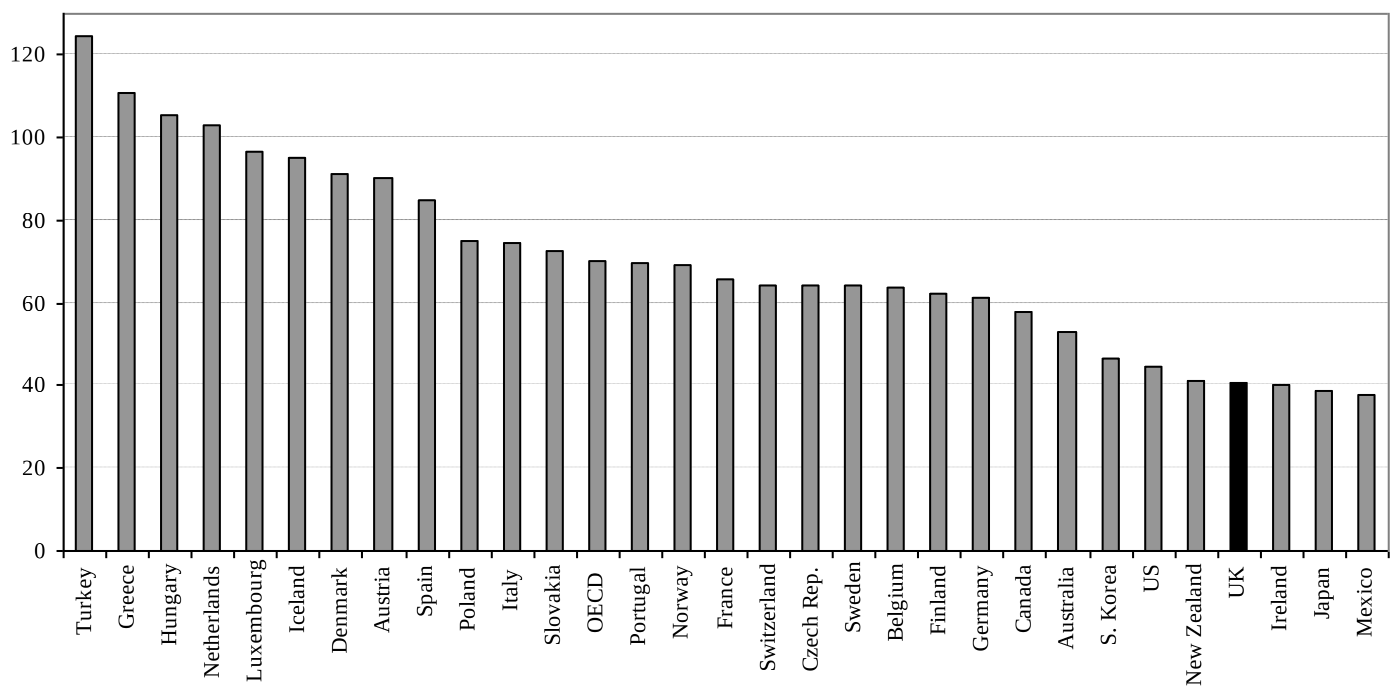



Figure 2.2. Net pension replacement rates for an average earner in OECD countries. The rates reported refer to men workers and are the same for women in all countries except Italy (women net replacement rate is 58.1%), Mexico (31.5%), Poland (55.2%), and Switzerland (65.3%). Measured in per cent. *Source: Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries - OECD © 2009*.



As Antolin and Whitehouse (2009) point out, it is not a coincidence that the UK has a big private pension fund sector and a low replacement rate. This is the result of the regulators' systematic efforts to reduce state pensions and establish private pension provision. Thus, they have motivated employees to opt for the private sector without making contributions to it mandatory, which highlights the large degree of responsibility the private sector has now for pension provision.

Regulatory development has ensured that the private sector can step up to this responsibility. In the UK private pension provision in the form of occupational pensions has had a longer history and tradition than public pensions. Indeed, the first type of state pension in the UK was organised in the early 1800s for civil servants and, as such, the scheme created was more occupational than state pension. In order to illustrate the place and role that the private sector has for pension provision in the UK the next part describes in more detail the regulatory development of the two sources of private sector pension provision: occupational and personal.

### 2.2.1. Occupational pension schemes[10]

In terms of definition, the OECD classifies a pension scheme as occupational when the membership is linked to an employment relationship between the scheme member and the scheme sponsor. It is voluntary for employers to set up a pension scheme and, as of 2012, it is voluntary for employees to participate in it. The size of the company affects the employer's decision to organise such a scheme. Mayhew (2001) points out "around 70% of large organisations (with 20 or more employees) make pension provision for employees whereas only 36% of smaller organisations (less than 20 employees) do so."

Early forms of occupational pensions date back in the 13$^{th}$ and 14$^{th}$ centuries. Funded forms of occupational pensions have existed since the mid-1700s and schemes that are closer to what is today recognised as occupational pension were introduced in the 19$^{th}$ century by

[10] The next parts of section 2.2 are based on Blake (2003a) and the "Pension Trends" publication by the Office for National Statistics. Any other sources are quoted in the text.

individual companies, e.g. East India Company, London and North Western Railway Company etc.

The legal framework for occupational pensions was organised for the first time in the 1834 Superannuation Act. The 1921 Finance Act introduced tax relief for contributions towards an occupational pension which made it affordable to a wider population range (Mayhew, 2001). Nonetheless, what has really shaped occupational pensions during these ‘early regulation’ days was the 1927 Superannuation and Other Trust Funds Act. It set up most schemes in the UK as pension trust funds. As of June 2012, occupational schemes still have trustees and are governed by Trust Law.

The next significant regulatory contribution came with the 1959 National Insurance Act which introduced the first additional state pension GRAD. Although it didn’t affect directly occupational pensions, it effectively presented them as a substitute to state pension. This was achieved by means of the contracting-out option, which was further established by the 1975 Social Security Pensions Act. Employees who opted to keep an occupational pension instead of the additional state pension were in a way rewarded by paying lower national insurance contributions. This represented an incentive to shift from public to private pension provision and has very effectively promoted the development of the private sector.

Another milestone for the development of occupational pensions has been the establishment of a supervision system protecting scheme members. [11] The 1973 Social Security Act created the Occupational Pensions Board (OPB), which was the first form of a supervisory authority in this sector. Its main responsibility was to control individual schemes to ensure that they provided equal access to employees, fulfilled the contracting-out criteria, and early leavers didn’t lose out on benefits.

However, the Maxwell Affair demonstrated that tougher regulation was needed. In response to this scandal, the 1995 Pensions Act set up the Occupational Pensions Regulatory Authority

[11] See Gilling-Smith (1973) for a discussion on the importance of the 1973 Social Security Act.

(OPRA) which took over the responsibilities of the OPB and was given more wide-ranging powers. Trustees were placed under the full supervision of OPRA that could now appoint, suspend, or completely remove them. Every pension scheme has since been obliged to employ an auditor and an actuary.

The 1995 Pensions Act also introduced the Pensions Compensation Board. The main purpose was to protect occupational pension scheme members by organising compensation procedures in case of employer bankruptcy or embezzlement. This board was replaced in 2005 by the Pension Protection Fund, according to the 2004 Pensions Act. The same act also replaced OPRA with the Pensions Regulator.

Occupational pension coverage is quite widespread in the UK. According to the Office for National Statistics (ONS) there were approximately 27.7 million members of occupational pension schemes in 2008. [12] In terms of membership status, 9 million were active members, i.e. employees who were making contributions through their work at the time. Another 8.8 million people were already receiving a pension. Last, 9.9 million were members with preserved pension entitlements - also known as "deferred members". This category includes former employees who have pension rights within a scheme and don't receive any pension yet as well as dependent persons.

The ONS provides membership information according to the economy sector as well. From the 27.7 million members in 2008, 15.3 million were from the private sector whereas 12.4 million were from the public sector. Total membership increased from 22.2 million in 1991 to 27.7 in 2008. This increase is rather attributed to the expansion of the public sector membership. For the same time period there was a 44.2% increase in membership of the public sector compared to the more modest increase of 12.5% in the private sector. However, there has been little variation in total occupational pension scheme membership in the 2000s. This is additionally supported by OECD information according to which around 47% of the

[12] Occupational Pension Schemes, Annual Report 2008 - ISBN 9781857747003.

employed working population was covered by an occupational pension in 2006. In 2000 this was 46% of the employed population. [13]

Although occupational pension scheme coverage has changed only slightly, contributions to occupational pension funds increased by almost 70% from £36.7 billion in 2001 to an astounding £62.1 billion between the years 2001 and 2008. This is rather attributed to the high increase of contributions paid by employers, which almost doubled from £26.6 billion in 2001 to £47.5 billion in 2008. Employee contributions increased by 44%, reaching £14.6 billion in 2008, having stayed at around the same level since 2006.

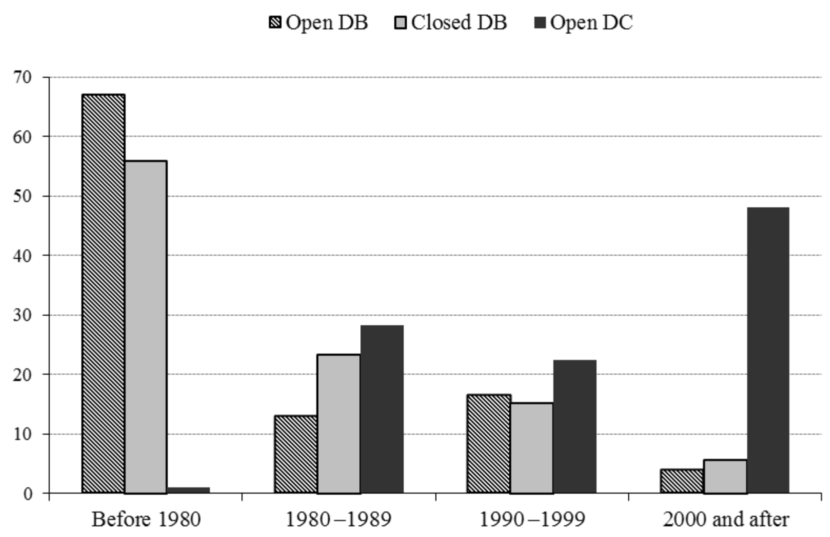
Apart from coverage and contribution, one of the biggest changes in the sector involves the benefit structure of occupation pensions. As it was briefly mentioned earlier, one very important characteristic of occupational schemes is the way pension income is calculated and this depends on whether schemes are offered on a defined-benefit (DB) or a defined-contribution (DC) basis. In a DB scheme in the UK the pension depends on the years of work and the salary received, adjusted for inflation. This can refer to the final salary, the average salary throughout one's career etc. depending on the terms of the scheme. The pension benefits are predetermined and independent from the return of the fund. As such, members can at any point calculate their pension benefits, while the employer carries the risk of low investment returns.

With a DC scheme on the other hand, the pension received cannot be calculated before retirement. The contributions are invested in a fund and at the time of retirement the proceeds from the fund are used to purchase an annuity that will provide the pension income.[14] As such, the pension depends on the amount of contributions made, the return of the fund, and the type of the annuity. Therefore, the employee carries the risks of poor investment performance and low annuity rates if such occur.

[13] Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries, OECD 2009.
[14] Although purchasing an annuity is the most common option, members have the option to keep the fund and withdraw capital as needed. This is known as an unsecured pension or pension drawdown. It is not possible after the age of 75.

The shift from DB to a DC pension structure has been markedly pronounced in the UK occupational pension sector. Figure 2.3 shows the proportion of DB and DC occupational pension schemes that have been founded within each of the last three decades. A remarkable 67% of open DB schemes opened before the 1980s, whereas only 4% opened during the 2000s. Similarly, more than half of closed DB plans were founded before 1980. On the other hand, only 1% of open DC schemes opened before 1980, with almost half opening in the 2000s.

Figure 2.3. Occupational pension schemes by foundation date and type, 2007. Measured in per cent. *Source: Office for National Statistics, Pension Trends, Chapter 6: Private Pensions, June 2009. The particular figure is based on Figure 6.2.*




This trend has been continued in the years following 2007. The ONS reports that 56% of active DB members joined schemes that opened before 1980 whereas 95% of active DC members joined schemes that opened after 1980.[15] This is a very clear shift in the balance between DB and DC schemes in this sector and there are concerns that this may lessen the importance of occupational pension provision (Neuberger, 2005). Even so, more recent reforms are expected to make this shift permanent and increase DC membership even further.

[15] Pension Trends, 2011, Office for National Statistics.

The 2008 Pensions Act established a ‘personal accounts’ system that is essentially a trust-based DC pension system where each eligible employee has an account. Contributions are paid into this account by both the employee and the employer but the main advantage is that this account is fully portable and not connected with any employer. Consequently, it is a hybrid of occupational and personal pension. The target group are employees that do not have any type of occupational pension. This system, which has been renamed National Employment Savings Trust (NEST), will be introduced in 2012 and will spread the coverage of DC private pensions even further.

In view of this significant development in the occupational pension sector it becomes essential to put together what is known about the operation of DC schemes. The personal pension industry is particularly suitable as it operates in the same environment. As it is one of the first personal pension sectors to be organised in Europe there are valuable lessons to be learnt.

### 2.2.2. Personal pension schemes

Compared to the long history of occupational pension schemes, the second component of private pension provision is relatively young. Personal pension schemes offered by insurance companies have been available to the self-employed since 1956. However, it was not until the 1980s that they were considered as an option for the wider public.

The first type of personal scheme was the Personal Pension Plan (PPP), introduced in 1988. The second type was the Stakeholder Pension Scheme (STK), which was introduced in 2001. They are provided by institutions such as insurance companies, friendly societies, and banks. Both types operate on a defined-contribution basis. Hence, any risks associated with fund performance and annuity rates are carried by the scheme member.

Participation to a personal pension scheme is voluntary. Although the coverage is not as extensive as that of occupational schemes, there were already 5.3 million people enrolled in a personal scheme in 2004.[16]

*Personal pension plans (PPP)*

Personal pension plans were set up by the 1986 Social Security Act and became available in July 1988. All operations concerning personal pension plans are supervised and regulated by the Financial Services Authority. As already mentioned, employees of appropriate occupational pension schemes were given the option to contract-out of additional state pension. Members of personal pension plans had this possibility as well. Consequently, personal plans were presented as substitutes to additional state pension, same as occupational schemes. Half a million policies were sold within the first three months after the PPP introduction. By 1999 there were approximately 7 million policy-holders.

In effect, PPP replaced the Retirement Annuity Contract (RAC). RAC was a type of pension plan introduced by the 1970 Income and Corporation Taxes Act available to the self-employed and those who didn't have access to an occupational pension scheme.[17] The purpose of RAC was the accumulation of a large sum that would finance a person's retirement income in two ways: receipt of a lump sum at retirement and purchase of an annuity. Sale of these contracts seized in July 1988, right before PPPs became available. However, people already in possession of a RAC could continue making contributions.

The principal advantage of personal pension plans is their flexibility as membership is not linked to employment. Members can also invest in different funds or control the investment decisions themselves. Despite the flexibility they offer, there have been concerns on the administration fees of these schemes. To encourage participation in personal pensions the Blair government has introduced less costly personal plans, called stakeholder pensions.

[16] Private Pensions Outlook 2008 - OECD © 2009 - ISBN 9789264044388

[17] They are also referred to as "section 226 contracts" because they were defined in section 226 of that act.

*Stakeholder pension schemes (STK)*

Stakeholder pension schemes were introduced from April 2001 by the Welfare Reform and Pensions Act 1999. Part of their regulation was also set up in “The Stakeholder Pension Schemes Regulations 2000 - SI 1403”. They were designed as a more affordable version of personal pension plans and, as a consequence are very similar to them. A stakeholder pension can also be used to contract-out of the second state pension.

The difference between STK and PPP lies principally in management fees and contribution limits. Personal pension plans face no regulatory restrictions on charges or penalties they can impose and have full flexibility in determining the level of minimum contribution. It is up to each individual to accept the conditions of each provider. Stakeholder schemes, on the other side, are subject to regulatory restrictions. In detail an STK has the following conditions:

- there is a maximum management fee charge at 1.5% of the fund value per year for the first 10 years and 1% afterwards;

- there is no penalty on altering or stopping contributions and transferring benefits to another scheme;

- contributions are flexible;

- the minimum contribution cannot exceed £20 in any period.

According to these conditions, a stakeholder scheme is actually a personal pension plan that accepts small contributions and imposes low management charges. The purpose of introducing this type of personal pension was explicitly to attract low-earners to the private sector of pension provision. As Jarvis (2001) points out: “The target group for the new pensions are those in the workforce on moderate earnings who do not have access to good occupational schemes and for whom personal pensions are poor value, largely because of their high charges.”

Stakeholder schemes are available to any UK resident aged below 75. Policy-holders can start receiving pension benefits at any time between the age of 55 and 75. The regulation of STK is divided between the Pensions Regulator - previously known as OPRA - and the FSA. The former oversees the application for and registration of new stakeholder schemes. The latter regulates their sale and promotion.

An interesting point that describes the dynamic between PPPs and STKs is made by Tonks (1999). He argues that the establishment of personal pension plans in the late 1980s weakened the importance of the second state pension. However, he comments that the introduction of stakeholder schemes could in their turn, diminish personal plans. STK look like "a superior alternative to personal pensions, and are likely to drive the more complex and expensive personal pensions out of the market".

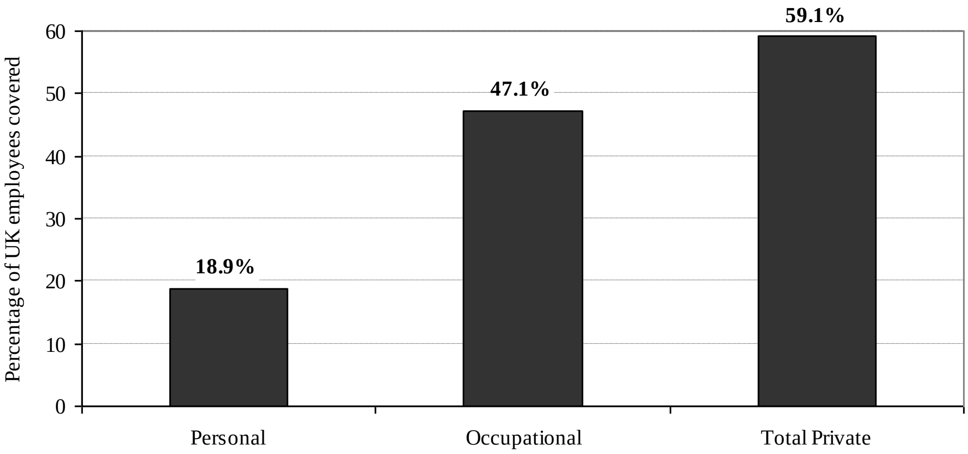
*Group pension plans*

Although it is not a 'distinct' form of personal pension, for employers group pensions are an alternative to occupational schemes. Employers can enter into an agreement with a financial institution to provide personal pension to their employees. It is a collective agreement and the personal pension can be either PPP or STK. As such, group personal pensions are usually organised and sponsored by the employer. Nevertheless, the legal contract exists only between the financial institution that provides the pension and each individual employee. Due to the collective character of this procedure economies of scale can arise for the pension provider, resulting in lower costs. Employees could benefit from this, as lower costs for the provider could imply lower charges.[18]

Any employer who has more than five employees is obliged to offer some form of pension provision to the employees. The options are membership in an occupational pension scheme, a group personal pension, or access to a stakeholder pension plan. Figure 2.4 shows the percentage of employees in the UK covered by different types of private pension provision in 2007, as reported by the OECD.

[18] Complementary and Private Pensions throughout the World 2008 – ISSA/IOPS/OECD © 2008.

Figure 2.4. The percentage of UK employees covered by a pension provided by the private sector in the year 2007. The coverage is reported for occupational schemes, personal schemes, and total private sector. The number for total private sector is free of double-counting employees covered by an occupational and a personal scheme. Measured in per cent (%). *Sources: Pensions at a Glance 2009: Retirement-Income Systems in OECD countries - OECD © 2009.*




According to this figure, 59% of all UK employees had a private pension in 2007. Almost half of all employees participated in an occupational pension scheme, whereas one in five was contributing towards a personal pension.

In conclusion, the private pension industry in the UK poses a special case study. The private sector is characterized by long history and tradition. Replacement ratios indicate that the private sector plays a bigger role than the public sector in replacing income in retirement. Additionally, regulation itself has been developed according to past experience thus helping to establish a strong funded system. An important feature has been the promotion of the personal pension sector with efforts to maintain personal pensions at an affordable level. Other countries undertaking pension reform can learn from the UK experience in several ways. These can relate to regulatory development and reform, particularly when introducing new DC schemes or to the overall performance of the personal pension industry. The investigation of the latter is the main purpose of this thesis. Using a new database by Morningstar Direct™ this thesis is going to address several questions that will allow a better understanding of the characteristics of this DC industry.

### 2.3. Data

This part describes the data that is going to be used in this thesis and reports some initial statistics that illustrate the development of the personal pension fund industry in the UK as well as what it has to offer to potential members.

The data is provided by the UK Life and Pension database which was launched by Morningstar Direct™ in 2008. This database provides data on pension funds offered by private institutions (e.g., insurance companies, friendly societies) in the UK since 1968. The pension funds covered by the database serve personal and stakeholder pension plans for private individuals, group personal, or stakeholder plans for employers to offer in lieu of occupational pension. These funds are organised by financial institutions and are available to any individual independently of employment status. They should be clearly distinguished from the 'classic' occupational pension schemes, which are organised by the employer and are offered only to employees.

By the end of December 2009, i.e., when the data used in this dissertation started to be collected, the database consisted of an unbalanced panel of 12,307 pension funds. Although the database has been updated frequently there may be occasional delays in reporting newly launched or closed funds, so some funds that are available in the market may not be immediately included. However, the number of missing funds from the above panel is estimated to be less than 4% of the total number of funds reported.[19] Thus, the sample covers almost the entire market of available personal pension funds.

For each fund the following information is available: a fund's name, provider's name, inception date, and the investment sector a fund belongs to according to the Association of British Insurers (ABI) classification. Quarterly and yearly returns on the portfolios are available since 1972 and monthly returns on the portfolios are available since January 1980. Fund allocation data, such as asset allocation, regional exposure, industry sectors etc., are provided both at a cross-sectional level and as time-series. The time-series are observed

[19] According to Morningstar information there are less than 500 missing funds from the panel.

monthly from December 2002.

The data collection was a challenge in itself. The data was downloaded over a period of four months. As the Morningstar database is frequently updated to include newly opened funds the sample had to be cleared off any observations starting from 2010 which was done in a month. A further six months were required for the formatting of the downloaded data due to the large sample size. The main characteristics of the industry were identified during this period. This included the classification of funds according to their investment style (see below) and the identification of the pension fund providers for which information on origin, founding date, past mergers and acquisitions was collected manually from each corporation's website. All statistics that are presented below (and some from Chapter 4) were calculated during these six months as well. A further three months were used to gather information on the fund-specific benchmarks and calculate their corresponding returns (see section 3.2.2 in Chapter 3)

At the end of 2009 there were 63 pension providers in the personal pensions market. (Appendix A provides their names, entry year, and the total number of funds each of them was managing, as of end-2009). Almost half of these institutions started offering funds in the 1980s and in the early 1990s forty-five out of these sixty-three companies were already active. Figure 2.5 shows the number of new providers entering the market in the period 1968-2009. It shows that the 1980s were the years of the greatest activity with at least 2-3 new providers entering the market each year. However, this frequency of entry declined significantly in the 1990s and became almost non-existent since 1999.

However, the decline in the number of new providers is not associated with a decline in the number of new funds offered to the public. On the contrary, as Figure 2.6 shows, although almost all providers had already started operating in the UK by 2000, the number of new funds that have been incepted after this year has increased dramatically.

Figure 2.5. The number of providers entering the market in each calendar year for the period 1968-2009. *Source: Own calculations using Morningstar Direct™ data.*

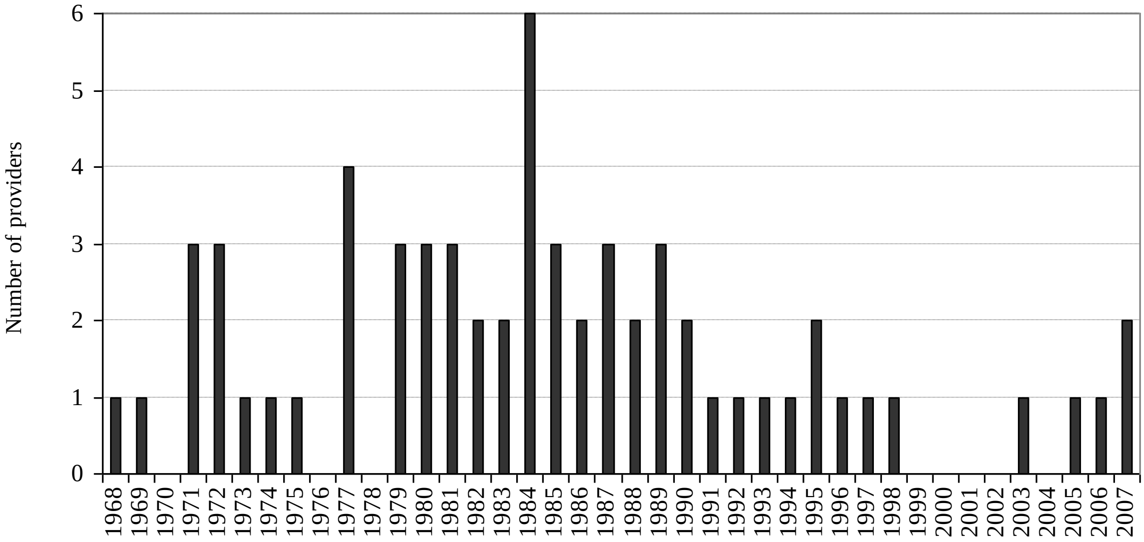
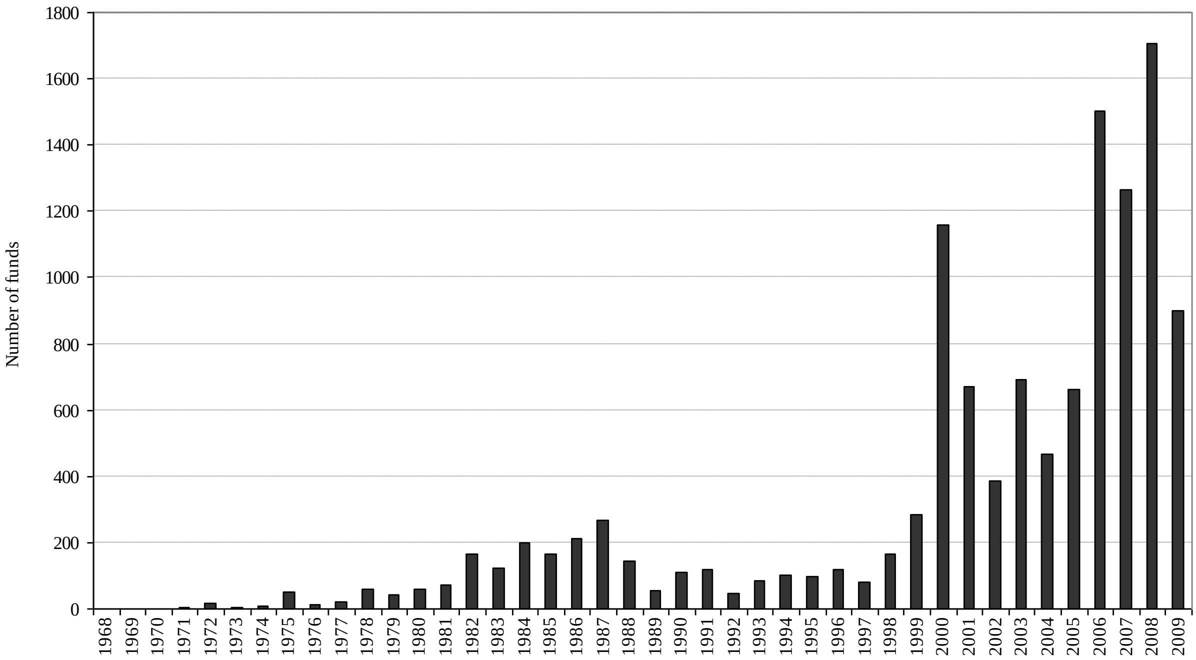


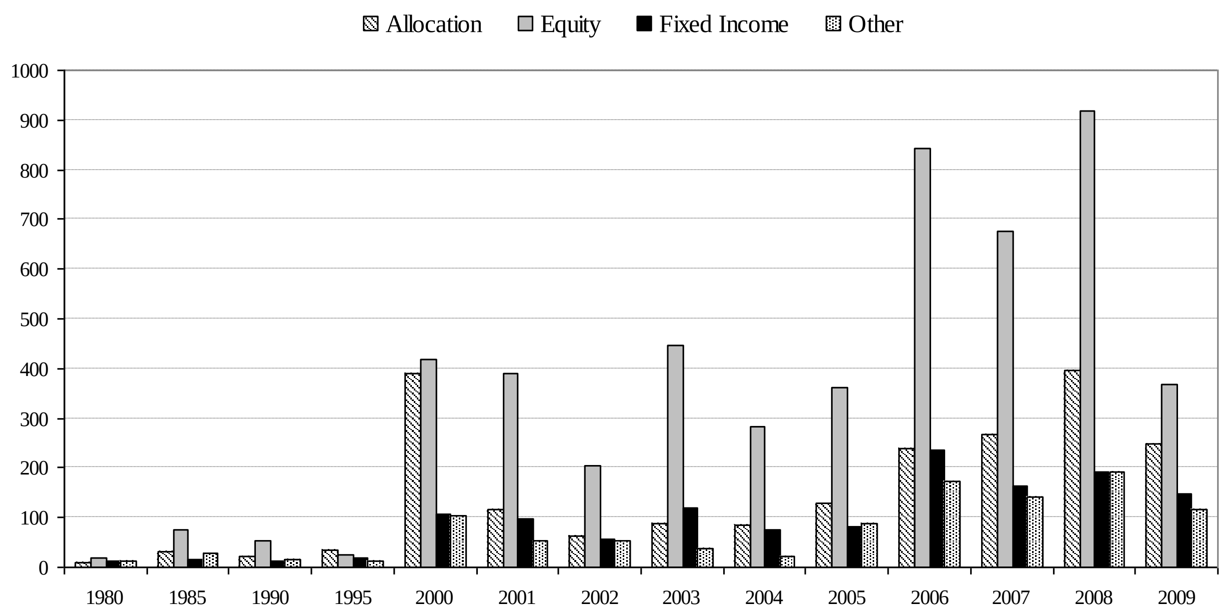

Figure 2.6. The number of pension funds incepted each year in the period 1968-2009. *Source: Own calculations using Morningstar Direct™ data.*



Approximately 76% of all funds have opened since 2000. An unprecedented number of funds (1,157) opened in 2000. The following years followed with a bit more modest numbers of new openings but still every year from 2001 onwards there were more new funds opened than in any year before 2000. 2008 was another record year with 1,708 funds incepted in that year alone. However, the distribution of these openings was rather uneven with just a handful of providers contributing to this record figure. In summary, nearly 70% of all funds have been opened since 2001 and approximately 50% of all funds have been incepted after 2004.

It is interesting that the increase in the number of portfolios is highly correlated with the change in the investment style (Appendix B describes the investment style classification based on each fund's ABI category and provides the definitions of the ABI categories). A small proportion of funds provided by Morningstar Direct™ are not classified, but these with classification are presented in Figure 2.7. [20] This figure shows the number of funds that were opened each year over the period 1980-2009 classified within the following broad investment sector categories: allocation, equity, and fixed income. Category 'other' includes the other four broad investment sectors: money market, real estate, protected, and specialist.

Figure 2.7. Number of funds per broad investment sector, opened in 1980-2009. 'Other' includes money market, real estate, protected, and specialist funds. *Source: Own calculations using Morningstar Direct™ data.*

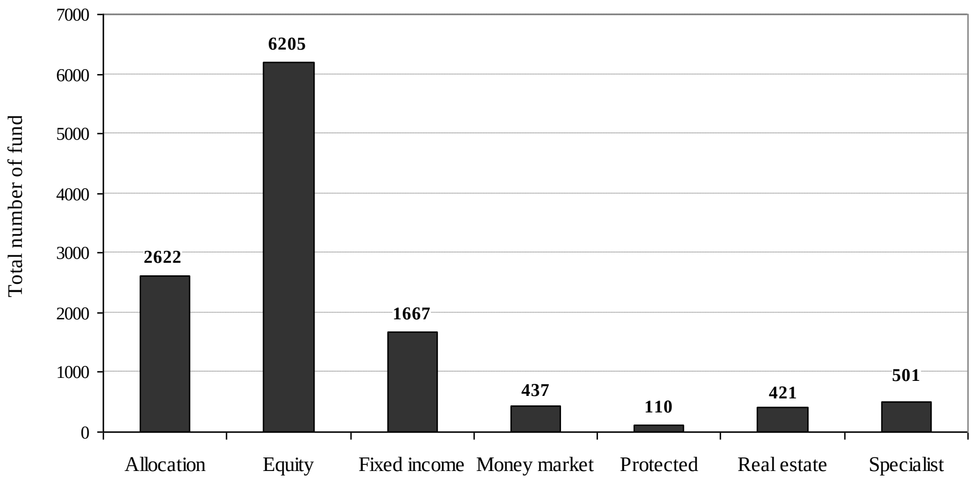



[20] There are 229 funds for which no information on investment strategy is available.

It should be explained at this point that funds classified as 'allocation' can invest in equity but it is optional to do so. Typically, there are restrictions on what proportion of the fund can be allocated in equity as the primary investment focus of the allocation style is to provide a 'mixed' portfolio. However, as it is probably correct to say that allocation funds typically exercise their right to invest in equity, we can also say that in every calendar year the number of new funds investing in equity was higher than the numbers of funds restrained from equity investments. Moreover, the proportion of new equity funds to the total number of funds opened in each calendar year has increased dramatically since 2000.

The high proportion of equity funds is even more visible when we measure the number of funds over the entire sample that have been classified within one of the seven broad investment sectors. Figure 2.8 shows the total number of funds per sector.

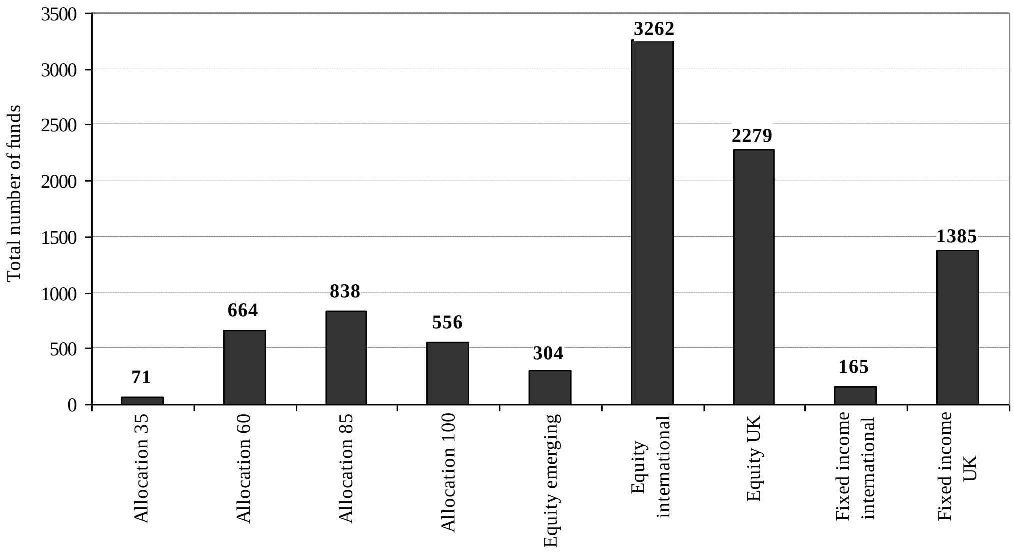
Figure 2.8. Total number of funds per broad investment sector as of December 2009. *Source: Own calculations using Morningstar Direct$^{TM}$ data.*




Since many funds in the allocation category include equity investments, the vast majority of portfolios is sensitive to stock market fluctuations. Figure 2.9 makes this point clearly visible using a more narrow investment sector classification. Here the four least numerous categories, i.e., money market, protected, real estate and specialist, are dropped, but the three biggest categories are further expanded. Figure 2.9 shows that in the allocation group the largest subgroups are those with a potentially high percentage of equity exposure. Allocation

100, Allocation 85 and Allocation 60 (all together 2,058 funds) are more numerous than the Fixed Income group (1,550).

Figure 2.9. Total number of funds per narrow investment sector as of December 2009. *Source: Own calculations using the Morningstar Direct™ data.*




The above statistics show that the private pension sector has grown substantially over the last ten years. Although the number of providers has hardly changed, the number of funds available to the public has ballooned. Moreover, these new funds are predominantly equity and fixed income oriented. Figure 2.9 shows that over 89% of all fixed income funds invested purely on the UK domestic market. Although this statistic refers to the overall sample, the proportion has been more-or-less constant over the years. The equity funds were more balanced, with only 39% of them investing purely on the UK market (allocation funds are excluded from this statistic). Similar to fixed income funds, the proportion of UK equity funds to international equity funds has not changed significantly over the last thirty years. However, one significant change took place in the international equity group, the UK pension funds started to invest in emerging markets. While in the 1980s and 1990s there were nearly no funds specialising in emerging markets, this has changed after 2000. Nearly 300 funds, or over 92% of the emerging equity funds, have been incepted after 2000.

The next chapter discusses fund performance research and shows that the results of the related literature would suggest poor performance for these funds. However, due to the nature of the benefit structure, investment returns are crucial for the members' retirement income. Chapter 3 deals with the first objective of this thesis which is to investigate the performance of this sector using an innovative methodology of performance assessment. Additionally, it posits that fund performance is connected with the fund's age and stipulates on the nature of this connection. Chapter 4 addresses the second objective of this thesis which is to examine the ever-growing trend of outsourcing the management of these funds to external wealth management companies. As it is demonstrated later, outsourcing has important implications on the return-risk profile of the fund, and thus, more importantly on its performance. Chapter 5 studies the possible causes for the boom of fund management outsourcing by looking at different factors that affect the decision to delegate fund management to an external firm which is third and final objective of this thesis.

## CHAPTER 3: PERFORMANCE AND FUND AGE

This chapter examines whether the performance of the UK personal pension funds is related to fund's age. The first section opens with a review of fund performance literature and argues that fund's age has not received enough attention, although there are strong arguments on why it should matter. It posits that age is a potentially important factor in explaining performance. The second section discusses the methodology used to assess fund performance in this study. It demonstrates that applying a CAPM or APT framework may not be appropriate for the analysis of fund performance and proposes three alternative measures. Descriptive analysis shows that on average funds outperform their benchmarks. Subsequent regression analysis explores factors that are potentially important in explaining fund performance both individually and interactively with fund's age. The final part reports and interprets the results. The chapter concludes with a discussion on the limitations of the analysis and points out possible directions for further research.

### 3.1. Literature review and hypothesis statement

Fund performance is a subject that has been researched systematically and in great length. Questions like whether funds outperform certain benchmarks or whether there is any consistency in fund performance are approached repeatedly and from different angles. The results are fairly consistent. Funds – of any type – underperform their benchmarks, their performance shows some short-term persistence, managers have some selection but poor timing skills and it pays off to employ highly educated managers. An extensive but not exhaustive part of this literature is discussed below followed by the development of a new angle to assess fund performance.[21]

The early work on fund performance concentrates on mutual funds in the United States and documents the absence of abnormal returns (Sharpe, 1966; Jensen, 1968). This result is confirmed by subsequent papers (Henriksson, 1984; Davis J.L., 2001). More recent literature

[21] The literature discussed here focuses on mutual and pension funds in the United States and the United Kingdom.

based on samples covering most of the years between the 1960s and the 1990s finds that funds significantly underperform given benchmarks (Elton et al., 1993; Carhart; 1997; Bollen and Busse, 2005) and particularly so when management fees are accounted for (Daniel et al., 1997; Wermers, 2000).[22] The evidence on mutual funds from the UK is very similar. In the period 1972-1995 Blake and Timmermann (1998) find that mutual funds significantly underperform multi-index benchmarks whereas results from a sample ranging till 2002 show negative but insignificant abnormal returns (Cuthbertson et al., 2008). Absence of abnormal returns is also found for mutual funds in a group of European countries during the period 1991-1998 (Otten and Bams, 2002).[23]

The performance results of pension funds are similar to those of mutual funds. Research on US pension funds finds that they significantly underperform allocated benchmarks and this result seems robust over time (1977-1983 in Ippolito and Turner, 1987; 1983-1989 in Lakonishok et al., 1992; 1993-1996 Ambachtsheer et al., 1998). Underperformance is also documented in several countries for a sample that extends until the mid-2000s (Antolin, 2008).[24] Evidence for UK pension funds is mixed with some results indicating clear underperformance in the period 1986-1994 (Blake et al., 1999; Blake et al., 2002) and others showing no significant abnormal returns for the period 1983-1997 (Thomas and Tonks, 2001; Tonks, 2005).

Another strand of literature investigates whether fund managers demonstrate selection and timing skills. The results on selectivity are rather varied. For US mutual funds there is indication that managers manifest on average positive selectivity which disappears when fees are considered (Daniel et al., 1997). However, Bollen and Busse (2005) show that only top performing managers have good selection skills (Bollen and Busse, 2005). Managers of US pension funds present some good selection skills (Coggin et al., 1993) whereas UK managers show neither positive nor negative selectivity (Blake et al., 1999).

[22] Elton et al. (1993) have a sample in 1965-1984, Carhart (1997) in 1962-1993, Daniel et al. (1997) and Wermers (2000) in 1975-1994, and Bollen and Busse (2005) in 1985-1995.
[23] The sample covers domestic equity mutual funds in France, Italy, Germany, the Netherlands, and the UK.
[24] This sample covers pension funds in Argentina, Australia, Canada, Chile, Czech Republic, Hungary, Japan, Mexico, the Netherlands, Poland, Sweden, the UK, and the US.

The results on timing skills approximated with the Treynor-Mazuy and the Merton-Henriksson factors (Treynor and Mazuy, 1966; Henriksson and Merton, 1981) seem more homogeneous. Managers of mutual funds are found to have no timing skills both in the US (Henriksson, 1984; Daniel et al., 1997) and the UK (Cuthbertson et al., 2008). For pension funds the results are somewhat bleaker. Pension fund managers are found to have negative timing skills both in the US (Coggin et al., 1993) and the UK (Thomas and Tonks, 2001).

Performance persistence and whether there is any consistency in the returns achieved by fund managers is another theme that often features in fund performance literature. There is evidence of short-term persistence for US mutual funds. This is attributed to funds tracking the S&P 500 (Brown and Goetzmann, 1995) or to the momentum factor explained in Jegadeesh and Titman (1993) (Carhart, 1997). This persistence is found for both the top and bottom performers (Carhart, 1997; Davis J.L., 2001). Bollen and Busse (2005) find some consistency only for the top performers while Daniel et al. (1997) find no persistence whatsoever. In the UK short-term persistence is found for both the top and the bottom performers (Blake and Timmermann, 1998). More recent work indicates that there is some consistency only for the bottom performers (Cuthbertson et al., 2008). No performance persistence is found for European mutual funds (Otten and Bams, 2002).

Evidence from the pension fund industry in the UK exhibits slightly mixed results. Brown et al. (1997) find short-term persistence only for top performers whereas Tonks (2005) show that although there is some persistence at both ends of the distribution, persistence net of fees remains only for the bottom performers. The period covered in these two cases extends roughly from the mid-1980s to the mid-1990s so the slight difference in the results can be explained by the difference in either the sample size or the performance measurement method.[25]

Overall, these results show that if persistence exists it is only short-term. Bessler et al. (2010) study the lack of long-term persistence in US mutual funds. They find that it can be explained

[25] Brown et al. have a sample of 409 funds and assess performance with the CAPM model controlling for timing whereas Tonks has a sample of 2175 funds and uses the CAPM, Fama-French and Carhart models.

by two ‘mean-reverting mechanisms’, (i) change of fund flows, and (ii) change of manager after a period of good or bad performance.

Finally, there is a considerable amount of literature devoted to the explanation of factors affecting fund returns. One part of it investigates to what degree personal characteristics of the fund manager are connected with fund performance. Golec (1996) and Chevalier and Ellison (1999a) show that for US mutual funds managers with an MBA degree perform significantly better than those without MBA. Another part focuses on how the characteristics of ‘fund families’ affect fund performance. Findings indicate that large families have funds that achieve higher performance than small families (Chen et al., 2004). Moreover, funds from large families show stronger performance persistence at the top than funds from small families (Guedj and Papastaikoudi, 2003).

It is important to note that among all these different questions surrounding fund performance one particular factor has been treated with less care and attention. This factor is time and, in particular, how performance changes with fund’s age. Fund performance literature includes fund’s age among other control variables only occasionally and finds no effect, for instance Carhart (1997), Ter Horst et al. (2001), and Chen et al. (2004) for US mutual funds or a negative relationship is found by Otten and Bams (2002) for some European mutual funds and Liang (1999) for US hedge funds. Despite these findings no concrete hypothesis is stated as to why fund age should be included in the analysis or what the expected outcome is.

The only exception known to the author is Blake and Timmerman (1998) who consider fund’s age as one of the factors explaining reasons to close down UK mutual funds. They argue that funds close due to continued bad performance whereas new funds are expected to have high performance. In particular, they argue that “new funds […] may attempt to attract investors by offering initial discounts and by attempting to establish an early strong track record”. Therefore, they expect performance to change throughout the funds’ operation. Indeed, they find that there is clear underperformance before closure but, more importantly, that newly opened funds underperform their benchmarks in the first month of operation, then outperform during the first year and this outperformance fades away afterwards. Although their analysis of fund age is descriptive and does not go into detail, the rationale behind their argument and the intuition behind their findings are consistent with the central hypothesis in this chapter (stated at the end of this part). There are concrete reasons to expect that fund performance changes with time and these are based on agency theory.

Agency theory is founded on the assumption that the assigned manager (the agent) doesn't act in the best interests of the investor (the principal).[26] Investors foreseeing this can engage in monitoring or set up contracts that align the manager's interests with theirs. A fundamental way to achieve this alignment is to connect managerial compensation to performance. However, Fama (1980) argues that reputational concerns can be as effective in incentivizing managers as compensation packages are. He points out that information on past performance is an important factor when determining future remuneration. Therefore, when there is little information about their skills, managers are motivated to work harder in order to signal their ability to the market, build up their reputation, and secure future compensation. Since the amount of available information increases with time Fama argues that managerial incentives change with time as well.

Holmström (1999) develops a theoretical model which formalises Fama's ideas. He shows that when little is known about managerial ability any piece of new information is important for their evaluation and, therefore, managers work hard at the beginning of their career/appointment due to 'career concerns' – same as Fama describes it. However, as time goes by the market creates a picture of the manager's skill and becomes less sensitive to new information. Thus, managers become less motivated to work hard to prove to the market how good they are. This theory is corroborated by empirical results for the mutual fund industry in the U.S. Golec, (1996) and Chevalier and Ellison (1999a) show that the age of fund managers covaries negatively with the fund's risk-adjusted performance, i.e., younger managers score significantly higher performance than older managers.

The same logic of information losing value with time can also be applied to fund's age. Indeed, there is evidence to suggest that investors are more sensitive to performance news of young funds than to those of old funds with fund flow levels changing more radically for

[26] Eisenhardt (1989) provides a detailed review of agency theory.

young funds (Chevalier and Ellison, 1997; Jylha, 2011). Moreover, Chevalier and Ellison, (1999b) and Brown et al. (2001) find that the probability of fund survival after a period of poor performance is significantly lower for young funds.

Overall, both theoretical and empirical work indicates that when little information is available any new information is very valuable and indeed, the market reacts more strongly to new information. Therefore, it should be expected that when a new fund opens and there is no past performance information any news on performance is crucial. Anticipating this, managers will apply all their efforts and skills to make sure that the first news about this fund's performance is the best possible in order to attract contributors. Over time as the market forms their opinion on the quality of the fund the pressure on delivering the best possible results may decline.

Since managerial efforts cannot be measured directly, they are proxied by fund performance. Consequently, based on the assumption that the value of new information diminishes with time, fund performance should be expected to be higher early in the fund's life. It should be noted that this hypothesis does not predict how long the period of high performance lasts or when the settling-down takes place or by how much the initial performance will be higher than the one later. What it predicts is that the settled-down level of performance will be lower than the performance level during an initial period of fund operation if career concern is the driver of fund performance and there are no offsetting forces.

## 3.2. Methodology and descriptive analysis

### 3.2.1. Performance measures

The first and most important methodological issue is how to measure fund performance. Early work is more descriptive in nature and used simple risk-adjusted return measures such as the Sharpe and the Treynor ratios (Sharpe, 1966; Treynor, 1965). Jensen introduced a measure of abnormal returns known as 'Jensen's alpha' (Jensen, 1968). This alpha measures the difference between an asset's realised returns and that of its expected returns according to the Sharpe-Lintner CAPM model (Sharpe, 1964; Lintner, 1965). However, the unrealistic nature of the CAPM assumptions triggered a discussion on the model's validity and usefulness (Jensen et al., 1972; Modigliani and Pogue, 1974; Blume and Friend, 1975). This culminated in Roll's critique who demonstrates that any mean-variance efficient portfolio could satisfy the CAPM model assumptions and, therefore, it would be impossible to identify the one true market portfolio (Roll, 1977). As such, testing the model's validity would not be feasible since it could not be discerned whether the model was invalid or the proxy used as the market portfolio was improper. Further work emphasizes the importance of using the mean-variance efficient market portfolio in order to assess the validity of the CAPM (Roll and Ross, 1994).

In response to these issues, another model was developed based on the Arbitrage Pricing Theory (APT) which has more flexible assumptions (Ross, 1978; Roll and Ross, 1980). Fama and French develop one particular form of the APT which proved to be very popular due to its ability to explain most of the variance in returns (Fama and French, 1993). This model is also found to account for many of the market irregularities that were previously unexplained by the CAPM (Fama and French, 1996) but its methodology is nevertheless criticized (Ferson et al., 1999).

Research on fund performance uses predominantly single and multi-index CAPM models (Jensen, 1968; Elton et al., 1993; Brown and Goetzmann, 1995; Blake and Timmermann, 1998) or CAPM models with higher moments (Thomas and Tonks, 2001; Blake et al., 2002;

Gregory and Tonks, 2004) or the Fama-French APT model with other factors such as momentum (Fama and French, 1993; Carhart, 1997; Otten and Bams, 2002). Few exceptions compare directly fund return to that of an assigned benchmark (Lakonishok et al., 1992; Blake et al., 1999) or measure performance in terms of risk-adjusted added value (Ambachtsheer, 1998).

Alongside the question of fund performance measurement researchers repeatedly stressed the importance of benchmark assignment. As funds hold diversified portfolios that invest in different asset classes, the use of one index possibly excludes asset types that are in the fund portfolio. At the same time, choosing one index as a benchmark for all funds is probably inappropriate as funds have distinct investment styles. Previous literature demonstrates in detail that the results of fund performance assessment relative to a benchmark depend to a large extent on the chosen benchmark (e.g. Elton et al., 1993; Dor and Jagannathan 2005; Chan et al., 2009).

The methodology in this thesis involves the use of fund-specific benchmarks. The Morningstar Direct™ database provides information on what the pension fund provider has declared to compare the fund's performance against. This is called "Primary Prospectus Benchmark" (PPB) and besides serving as benchmark it also has informational value as it is part of how the fund is marketed. The use of these fund-specific benchmarks allows the assessment of each fund's performance against benchmarks chosen by the provider and is not subject to individual judgement. For comparison purposes, the performance of equity funds is also measured against the FTSE All Shares index.

However, the question of how to measure fund performance against the PPB remains open. As described in the previous chapter, the funds in this sample have very diverse investment styles. Funds are classified into 32 distinct ABI sectors. Although this allows for a very narrow investment style classification across funds, it does not fully describe each fund's portfolio allocation. The definition of the ABI sectors in Appendix B implies that in almost all cases as much as 20% of the fund's assets can be invested in any other asset class. The application of a single or multi-beta CAPM model would be (with a high probability) incorrect because any constructed benchmark would not guarantee that all assets constituting a fund's portfolio would be included in the PPB. This raises the issue of the mean-variance efficiency of the market portfolio proxy. Moreover, a multi-factor APT model is not feasible as it would have to account for all asset classes and this would create technical issues relating to the choice and correlation between the variables.

Due to the impracticality of applying either a CAPM or an APT type of analysis, three alternative means are employed. The first one is the Sharpe ratio which is argued to be more comprehensible than other performance measures for investors and has widespread application in fund industries (Goetzmann et al., 2007; Eling, 2008). The other two measures employed here assess fund performance relative to a benchmark. The first of the two is the simple difference in returns, i.e. the return of the fund $R_i$ minus the return of the benchmark $R_B$,

$$dR_i = R_i - R_B \quad (1).$$

This is a very raw measure and simply shows by how many percentage points the fund return differs from the benchmark return. This measure is adopted as a means of comparison with the last performance measure which adjusts for risk. This is the M2 measure introduced by Modigliani and Modigliani (1997). The M2 adjusts the fund's return to the benchmark's risk. It involves the formation of a new portfolio that consists of the fund's portfolio and the risk-free asset. By borrowing or lending the latter the new portfolio can be brought to the same risk level as the benchmark portfolio. This allows the direct comparison between the new portfolio's return to the benchmark's return as they are both on the same risk level. Appendix C explains how this measure is calculated. Although the M2 is not without criticism itself (Goetzmann et al., 2007) it serves well as a measure of risk-adjusted performance over the assigned benchmark without creating problems of benchmark portfolio identification and market risk calculation.

### 3.2.2. Descriptive analysis

The sample from the Morningstar Direct™ database consists of 12,307 funds out of which 10,086 report monthly returns. The period of observation is from January 1980 till December 2009. Most of the funds opened at some point during this period so their return observations start at different points. This results in an unbalanced panel. The fund returns are reported as the per cent change in the fund portfolio price on month-end. All return observations are in GBP and are expressed as percentages (i.e. not decimal points).

Additionally, there are 8,933 pension funds with PPB information. In total there are 515 different benchmarks of which 389 are individual indices and 126 are composite benchmarks, i.e. they are weighted averages of specified individual indices (weights are provided). Returns of these benchmarks have been calculated based on data collected from DataStream. Due to insufficient benchmark information in the database and lack of data in DataStream, returns on 276 individual benchmarks have been collected. This group consists of 212 individual indices and 64 composite benchmarks. Overall, benchmark returns have been collected for 6,073 funds. Combining funds with both fund and benchmark return information reduces the sample 5,421 funds.

Another technical issue to be addressed is the frequency of the observations in the sample. Using monthly observations in a panel structure increases considerably the complexity of the analysis. The reason is that monthly returns are found to have strong time-series properties (e.g. long memory) which raise a new range of technical problems such as stationarity concerns. In order to minimise econometric issues the frequency is reduced from monthly to yearly, i.e. time-series properties of the variables are smoothed out.

This technique is similar to a moving-average smoothing (which is recommended if the long-term properties of a variable are to be explored) but avoids any observation overlapping. Average return and risk are calculated for each calendar year from 1980 to 2009. The average return is calculated in two ways:

- the arithmetic average of the monthly returns of fund, $\overline{R_{i,T}} = \left(\frac{1}{n}\sum_{t=1}^{n} R_{i,t}\right) \cdot 100$ ,

- the average cumulative monthly return, $r_{i,T} = \left[\left(\sqrt[n]{\prod_{t=1}^{n}(1+R_{i,t})}\right) - 1\right] \cdot 100$,

where $R_{i,t}$ is expressed in decimal points.

The calculation of the average cumulative monthly returns is also applied in Porter and Trifts (1998). The same procedure is applied to the calculation of the benchmark returns. These two averages produce almost identical fund returns and outperformance series. The correlation coefficient between arithmetic average and average cumulative monthly return is 0.9998. This is also the case for the corresponding outperformance measures. All the analysis presented in this and the next chapter is based on the average cumulative returns but the results are practically identical when the arithmetic average is used. The risk of the fund is calculated as the standard deviation of monthly returns in the corresponding calendar year.

The vast majority of yearly calculations is based on $n=12$, i.e. all twelve monthly observations in the calendar year are included in the calculation of the average return and sigma. However, in some cases, i.e. when funds opened sometime during a year, there are fewer than 12 observations for the first calendar year. Ignoring these observations is not an option since the first months of operation need to be accounted for in order to test the main hypothesis and identify the exact form of the connection between fund performance and fund age. To address this, a restriction is imposed that at least six monthly observations need to be available for a calendar year to qualify as the 'first' year of the fund. This reduces the sample even further to 4,909 funds and a total of 28,586 observations. Out of this reduced sample approximately 94% of the funds and of the observations fall under the category of allocation, equity, or fixed income funds. There are 320 allocation funds and 705 fixed income funds. Equity funds are by far the largest category accounting for around 73% of the sample's observations with 3,571 funds. Although the analysis that follows is applied to the total sample and these three investment style categories separately, equity funds are explored in more detail due to their relative size.

Out of the three performance measures, the Sharpe ratio and the M2 have some severe outliers. These are cases where the fund sigma takes values close to zero and as both measures are calculated with the fund's standard deviation in the denominator the overall ratios are inflated beyond proportion. Instead of removing these outliers both measures are winsorized (Wilcox, 2005). The winsorizing method applied here adjusts 0.5% of the distribution, i.e. 0.25% from each distribution tail of the Sharpe ratio and M2.

Figure 3.1 shows the histogram of fund returns for all 4,909 funds in the sample across all years in the 1980-2009 period. There is an obvious divergence from the normal distribution. Fund returns have a negative skewness of -0.64. Moreover, their distribution is more leptokurtic with a kurtosis of 4.6. It is important to note that almost 50% of the observations are concentrated in the 0%-2% interval, so approximately half of the fund returns are small positive numbers. With the exception of very few values the entire distribution is within the [-5%, +5%] interval. Figure 3.2 presents the histogram of the corresponding PPB returns. There is again a notable difference from the normal distribution but it is more pronounced than for the fund returns as PPB returns are more widely spread. They are also negatively skewed with skewness of almost -0.7 and have a kurtosis of 3.7. Nevertheless, it is interesting to notice that here too around half the observations are in the 0%-2% area and almost all of them are within the [-5%, +5%] range.

Figure 3.1. Histogram of fund returns. Funds of all investment types are included. The total sample is 4,909 funds with 28,586 return observations. It includes a reference line at 0 on the X-axis and one line for the normal distribution.

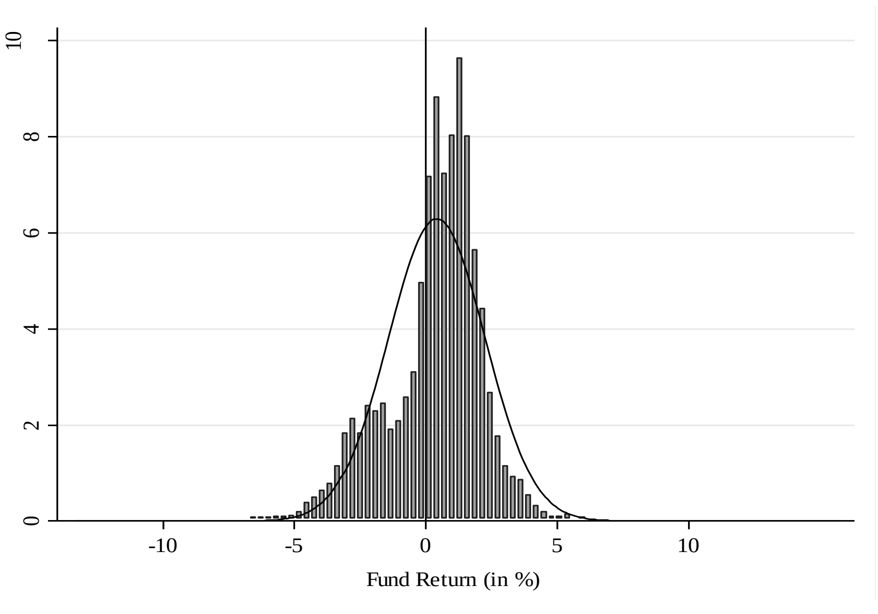


Figure 3.2. Histogram of PPB returns. PPBs for funds of all investment types are included. The total sample is 4,909 PPBs with 28,586 return observations. It includes a reference line at 0 on the X-axis and one line for the normal distribution.

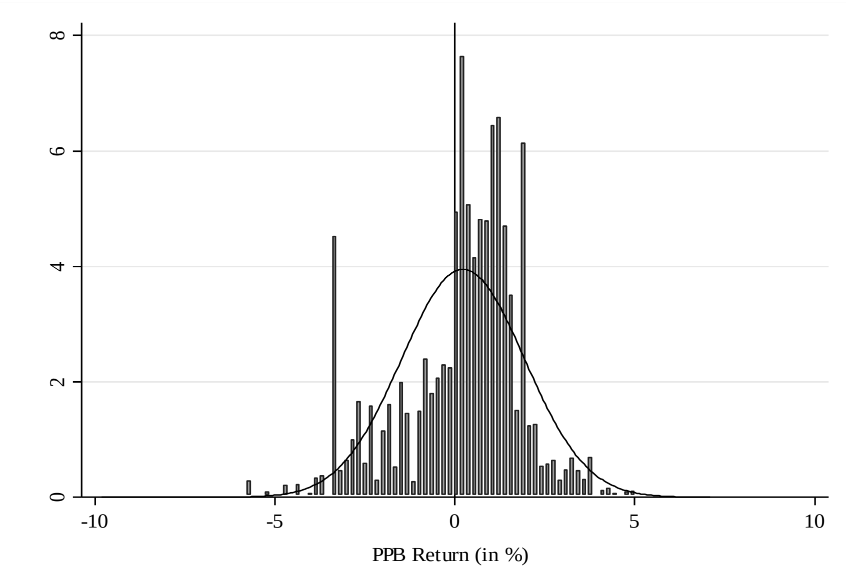



Figure 3.3 shows the distribution of the difference-in-returns. This distribution is more symmetric than the fund and PPB returns distributions but has also a negative skewness of -0.45. There is a high concentration around 0 but there are clearly more observations in the positive area. This suggests that on average fund returns are higher than the PPB returns.

The distribution of the M2 is shown in Figure 3.4. Fund returns are on average higher than PPB returns on a risk-adjusted basis. Note that the winsorized points are clearly visible in both tails. M2 is more skewed than the difference in returns with a skewness of -0.54. Since the average is in both cases positive, this implies that the risk-adjusted performance is higher than the not risk-adjusted one which in turn indicates that there is a difference between the fund's risk and the PPB's risk.

This is confirmed by the summary statistics provided in Table 3.1 which shows the average return, sigma, and Sharpe ratio for funds and their PPBs. Funds are also separated into the subcategories that are investigated further in the regression analysis. The principal feature is that although funds have on average both higher return and sigma than their PPBs, the difference in returns is higher than the difference in risk. Thus, funds manage to have on average higher Sharpe ratios than their corresponding PPBs.[27]

Figure 3.3. Histogram of difference-in-returns. Funds of all investment types are included. The total sample is 4,909 PPBs with 28,586 return observations. It includes a reference line at 0 on the X-axis and one line for the normal distribution.

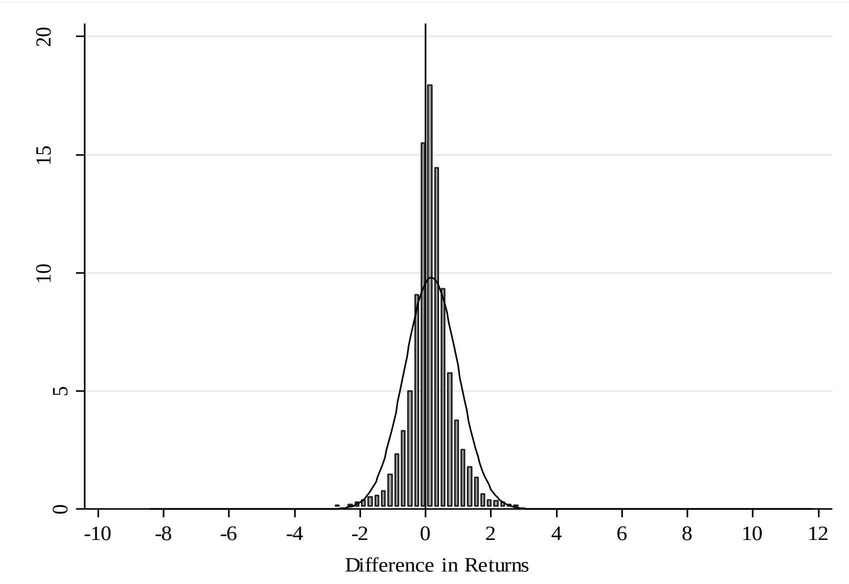
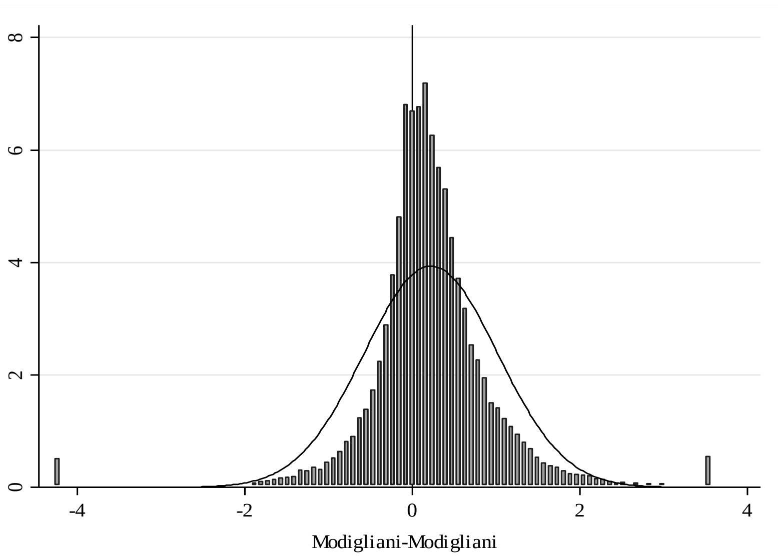



Figure 3.4. Histogram of M2. Funds of all investment types are included. The total sample is 4,909 PPBs with 28,586 return observations. It includes a reference line at 0 on the X-axis and one line for the normal distribution.




[27] Note that the Sharpe ratios for both funds and their PPBs have been winsorized by 0.5% from both tails.

Table 3.1. Summary statistics for fund and PPB returns.

| Sample | Category | Variable | Mean | St. Deviation | Obs. |
|---|---|---|---|---|---|
| All Funds | Fund | Return | 0.404 | 1.841 | 28586 |
| | | Sigma | 4.362 | 2.390 | |
| | | Sharpe | 0.038 | 0.416 | |
| | PPB | Return | 0.226 | 1.710 | |
| | | Sigma | 4.252 | 2.400 | |
| | | Sharpe | 0.004 | 0.367 | |
| Allocation | Fund | Return | 0.372 | 1.418 | 1579 |
| | | Sigma | 3.428 | 1.626 | |
| | | Sharpe | 0.080 | 0.385 | |
| | PPB | Return | 0.167 | 1.330 | |
| | | Sigma | 3.504 | 1.951 | |
| | | Sharpe | 0.015 | 0.359 | |
| Fixed Income | Fund | Return | 0.442 | 0.952 | 4380 |
| | | Sigma | 2.038 | 1.247 | |
| | | Sharpe | 0.001 | 0.397 | |
| | PPB | Return | 0.188 | 0.788 | |
| | | Sigma | 1.944 | 1.073 | |
| | | Sharpe | -0.165 | 0.380 | |
| Equity | Fund | Return | 0.407 | 2.020 | 21072 |
| | | Sigma | 5.041 | 2.165 | |
| | | Sharpe | 0.066 | 0.367 | |
| | PPB | Return | 0.238 | 1.881 | |
| | | Sigma | 4.881 | 2.192 | |
| | | Sharpe | 0.019 | 0.334 | |
| Emerging Equity | Fund | Return | 1.059 | 3.496 | 714 |
| | | Sigma | 7.210 | 2.706 | |
| | | Sharpe | 0.205 | 0.435 | |
| | PPB | Return | 0.950 | 3.224 | |
| | | Sigma | 7.328 | 2.576 | |
| | | Sharpe | 0.165 | 0.392 | |
| International Equity | Fund | Return | 0.413 | 1.905 | 11611 |
| | | Sigma | 5.335 | 2.190 | |
| | | Sharpe | 0.049 | 0.339 | |
| | PPB | Return | 0.259 | 1.706 | |
| | | Sigma | 5.185 | 2.216 | |
| | | Sharpe | 0.013 | 0.298 | |
| UK Equity | Fund | Return | 0.346 | 1.995 | 8747 |
| | | Sigma | 4.473 | 1.873 | |
| | | Sharpe | 0.076 | 0.392 | |
| | PPB | Return | 0.153 | 1.941 | |
| | | Sigma | 4.279 | 1.881 | |
| | | Sharpe | 0.015 | 0.368 | |

These conclusions are also corroborated by the results of t-tests reported in Table 3.2. There are two groups of t-tests in this table. The first group tests whether there is a significant difference in the means of fund and PPB returns, sigmas, and Sharpe ratios. The null hypothesis is that the means are equal and so their difference equals zero. The t-test is carried out assuming different standard deviations and the difference is calculated as the return, sigma, and Sharpe ratio of the fund minus that of the PPB. The second group tests whether the two performance measures, difference in returns and the M2 are significantly different from zero. The null hypothesis for this group is that the corresponding performance measure is not significantly different from zero. The t-statistics are reported for a 5% significance level.

The principal feature of this table is that with only a couple of exceptions, the differences reported in Table 3.1 between the funds and the PPBs are statistically significant. The main pattern is that fund returns and sigmas are significantly higher than those of PPBs and the mean difference in returns is larger than the mean difference in sigmas. Thus, funds have significantly higher Sharpe ratios than the PPBs. This is reflected in the fact that both difference in returns and the M2 are significantly different from zero but the average M2 is larger than the difference in returns. Therefore, on average funds have outperformed their PPBs in raw terms, and even more so in risk-adjusted terms.

It is to be noted that emerging equity funds don't have significantly different returns and sigmas from their PPBs but they have a higher Sharpe ratio at the 10% significance level. This ratio difference is significant due to the fact that emerging equity funds have on average higher return and lower sigma than their PPBs.

Table 3.2. Results of t-tests on the difference of mean return, sigma, and Sharpe ratio between fund and PPB (unequal variances) and of t-tests on mean difference-in-returns and M2 equalling 0.

| **Sample** | **Null Hypothesis** | **Variable** | **Mean** | **St. Error** | **t-statistic** | **p-value** |
|---|---|---|---|---|---|---|
| All Funds | Difference in Means=0 | Return | 0.178 | 0.015 | 11.945 | 0.0000 |
| | | Sigma | 0.110 | 0.020 | 5.509 | 0.0000 |
| | | Sharpe | 0.034 | 0.003 | 10.499 | 0.0000 |
| | Mean=0 | $R_{Fund}$-$R_{PPB}$ | 0.178 | 0.005 | 36.430 | 0.0000 |
| | | M2 | 0.222 | 0.005 | 47.041 | 0.0000 |
| Allocation | Difference in Means=0 | Return | 0.205 | 0.049 | 4.187 | 0.0000 |
| | | Sigma | -0.075 | 0.064 | -1.180 | 0.2382 |
| | | Sharpe | 0.065 | 0.013 | 4.880 | 0.0000 |
| | Mean=0 | $R_{Fund}$-$R_{PPB}$ | 0.205 | 0.019 | 10.646 | 0.0000 |
| | | M2 | 0.287 | 0.019 | 15.105 | 0.0000 |
| Fixed Income | Difference in Means=0 | Return | 0.254 | 0.019 | 13.578 | 0.0000 |
| | | Sigma | 0.094 | 0.025 | 3.784 | 0.0002 |
| | | Sharpe | 0.166 | 0.008 | 20.010 | 0.0000 |
| | Mean=0 | $R_{Fund}$-$R_{PPB}$ | 0.254 | 0.013 | 19.485 | 0.0000 |
| | | M2 | 0.260 | 0.011 | 23.431 | 0.0000 |
| Equity | Difference in Means=0 | Return | 0.169 | 0.019 | 8.877 | 0.0000 |
| | | Sigma | 0.160 | 0.021 | 7.522 | 0.0000 |
| | | Sharpe | 0.047 | 0.003 | 13.702 | 0.0000 |
| | Mean=0 | $R_{Fund}$-$R_{PPB}$ | 0.169 | 0.005 | 31.641 | 0.0000 |
| | | M2 | 0.223 | 0.005 | 43.465 | 0.0000 |
| Emerging Equity | Difference in Means=0 | Return | 0.109 | 0.178 | 0.611 | 0.5414 |
| | | Sigma | -0.118 | 0.140 | -0.843 | 0.3993 |
| | | Sharpe | 0.040 | 0.022 | 1.826 | 0.0681 |
| | Mean=0 | $R_{Fund}$-$R_{PPB}$ | 0.109 | 0.032 | 3.412 | 0.0007 |
| | | M2 | 0.292 | 0.033 | 8.844 | 0.0000 |
| International Equity | Difference in Means=0 | Return | 0.154 | 0.024 | 6.482 | 0.0000 |
| | | Sigma | 0.150 | 0.029 | 5.196 | 0.0000 |
| | | Sharpe | 0.036 | 0.004 | 8.702 | 0.0000 |
| | Mean=0 | $R_{Fund}$-$R_{PPB}$ | 0.154 | 0.007 | 21.067 | 0.0000 |
| | | M2 | 0.195 | 0.007 | 27.762 | 0.0000 |
| UK Equity | Difference in Means=0 | Return | 0.194 | 0.030 | 6.506 | 0.0000 |
| | | Sigma | 0.195 | 0.028 | 6.863 | 0.0000 |
| | | Sharpe | 0.061 | 0.006 | 10.612 | 0.0000 |
| | Mean=0 | $R_{Fund}$-$R_{PPB}$ | 0.194 | 0.008 | 24.132 | 0.0000 |
| | | M2 | 0.256 | 0.008 | 33.275 | 0.0000 |

### 3.3. Regression analysis

This part starts with a definition of the explanatory variables that are used in the regression analysis and describes the expected outcomes for each variable. It continues with a discussion of the technical issues that arise from the dataset structure and the methods used to correct them. This part concludes with a detailed description of the regression results.

In the first instance, the three fund performance measures are regressed on only the constant. The purpose for this is to test the significance of the average performance with more robust standard errors and get a confirmation of what the descriptive analysis has shown. This specification is extended to include explanatory variables as required in order to test the stated hypothesis and also variables that been shown by previous literature to have had an effect on performance. These are described in the following section.

#### 3.3.1. Explanatory variables

*Fund Age*

The age of fund *i* at year *t* is the principal explanatory variable ($age_{i,t}$). It is a continuous variable measured in years elapsed from the day of the fund's inception till the 31st December of each calendar year in the sample. It takes only values larger than zero. The regressions are run on the following functions of fund age:

$$f(age_{i,t}) = \begin{cases} age_{i,t} \\ \ln(age_{i,t} + 1) \\ \sqrt[2]{age_{i,t}} \\ \sqrt[3]{age_{i,t}} \end{cases}$$

For the logarithmic function age is scaled by adding 1 to each observation. If the stated hypothesis is true then fund performance has a convex relationship with fund's age where there is high performance at the start which settles down at a lower level as age increases. This implies that the sign in front of $f(age_{i,t})$ will be negative for all functions. Because the shape of the relationship is predicted to be convex, the linear function is expected to have a worse fit than the other functions as it implies that performance decreases at a constant rate the older the fund gets. Additionally, dummies are created that represent the fund's year of operation and they are used as an alternative measure for fund's age. The dummy for the first year of operation equals 1 if funds have been in operation for at least six months by the end of the corresponding calendar year. All subsequent operation year dummies are defined based on the first one. Dummies for each of the first ten years of operation are included in the regressions, i.e. $Operation\,Year_{i,t} = \{y1_{i,t}, y2_{i,t}, y3_{i,t}, y4_{i,t}, y5_{i,t}, y6_{i,t}, y7_{i,t}, y8_{i,t}, y9_{i,t}, y10_{i,t}\}$. There is a last dummy which equals 1 for operation year being 11 or more and this is left out for multicollinearity reasons. In particular, 86% of the funds do not have more than ten years in operation and, therefore, adding operational year dummies beyond the 10 year cut-off point increases multicollinearity substantially.

*Market Conditions*

The question of market conditions is approached in several ways in past literature. Research on fund performance focuses primarily on fund managers' timing skills, i.e. shifting the portfolio allocation to take advantage of a changing market environment (e.g. Treynor and Mazuy, 1966; Henriksson, 1984; Kao et al., 1998; Cuthbertson et al., 2008) or on ways to 'condition' the single-index alpha and beta parameters with variables relating to market conditions such as dividend yields and interest rates (e.g. Ferson and Warther, 1996; Otten and Bams, 2002; Cuthbertson et al., 2008). Another strand of work distinguishes explicitly between bearish and bullish periods when assessing performance using the CAPM or the APT (e.g. Fabozzi and Francis, 1977 and 1979; Capocci et al., 2005; Hibbert and Lawrence, 2010) and finds very little difference in the performance during these periods. However, Klein and Rosenfeld (1987) demonstrate that performance is upwards biased during a bull market and downwards during a bear market. They also show that this bias doesn't appear when performance is measured using a single-index model such as CAPM. This suggests that since the performance measures in this analysis are calculated outside the CAPM-APT framework controlling for market conditions may be important.

Controlling for market conditions presupposes the identification of the appropriate 'market'. As there is no detailed information on the exact portfolio allocation of each fund, the PPB is considered as a proxy of the market in which the fund invests most of its assets. Subsequently, the factors that characterise a bear and a bull market need to be formalised.

Early work defines bull and bear periods by the sign of the market index return where a positive return would signify a bull market and a negative return a bear market (Fabozzi and Francis, 1977). This method is implemented in similar ways in later work (e.g. Klein and Rosenfeld, 1987; Chordia et al., 2001; Hibbert and Lawrence, 2010). Additionally, more advanced methods are developed to identify bull and bear markets such as the Markov-switching model (Maheu and McCurdy, 2000; Chen, 2009) or locating turning points in composite index returns (Capocci et al., 2005; Gonzalez et al., 2005). After identifying the bull and bear periods, researchers also investigate what factors are related to these markets such as stock market trading (Chordia et al., 2001), investor sentiment (Baker and Wurgler, 2007), and macroeconomic factors (Chen, 2009).

Overall, the measures and methods applied in the literature are diverse but they all evolve around this common point: during a bear market there are negative returns and above average volatility whereas during a bull market there are positive returns and below average volatility. This is what characterises a bear and a bull market as it is assumed in Maheu and McCurdy (2000) and confirmed in different ways in Chen (2009) and it is what is applied here. Since the PPB is identified as the 'market', its return and volatility are used to express a bear and a bull market. As such, the PPB bear market dummy equals 1 if the average monthly return of the PPB of fund *i* is negative in year *t* and the PPB sigma for that year is above the average of all this PPB's sigmas in the period 1980-2009 ($Bear_{i,t}$). The PPB bull market dummy equals 1 where the PPB return is positive and the PPB sigma is below the 1980-2009 average ($Bull_{i,t}$ ). These two dummies are included in the regression both as part of the constant and as an interaction with the age function. It should be noted that there is a third 'normal' state that is neither bull nor bear and it is represented by the constant itself.

*Provider Characteristics*

A relatively recent development in fund performance literature is a shift in the focus from the fund to the 'fund family' and its characteristics (e.g. for US mutual funds see Massa, 2003; Chen et al., 2004; Nanda et al., 2004; Khorana and Servaes, 2011). The existence of a 'star' fund within a family and its positive spillover effects on other funds within the same family is one of the main themes in this work (Nanda et al., 2004). This effect implies that families allocate resources in a way that promotes the creation of a star fund which is perceived to be easier for larger families (Guedj and Papastaikoudi, 2003; Nanda et al., 2004). Another theme relates to how investors perceive funds and the main argument is that they consider both fund and fund family properties when making their investment choice. As such, families that are not good performers can use other means to appeal to investors such as product variety and market presence (Massa et al., 2003; Nanda et al., 2004). In line with this argument, the model controls for provider characteristics, such as size, market share, product variation, and provider age.

*Provider's Size*

Fund family size is argued to be positively related to fund performance due to economies of scale and the resources that are available to larger families (Chen et al., 2004). On the other hand, if size becomes more important than past performance in attracting investors, then families may stop prioritizing performance (Massa, 2003). Therefore, family size can also have an adverse effect on performance. The related literature uses assets under management as a proxy of family size but since this information is not available for this sample, the provider's size is approximated by the number of funds under operation at year-end. This includes all types of funds offered by the provider independently of investment style. The first lag of the variable is used in the regression and it is measured in 100's of funds ($Size_{i,t-1}$).

*Market Share in ABI Sector*

Market share is somewhat related to provider's size in the sense that it can have a positive effect on fund performance due to economies of scale. There relate to the accumulated knowledge and understanding for the particular ABI sector which are expected to have a positive effect on fund performance. Nevertheless, a too large market share implies a potential lack of competition within an investment style. In the absence of this competition there may be fewer incentives to outperform. Moreover, a provider dominating the market may eventually trace the corresponding market index. Assuming that this market index is more diversified than the fund's portfolio, the fund will underperform this index on risk-adjusted terms. Thus, a negative effect on fund performance can also be expected. Market share is proxied here by the number of funds within the same ABI sector operated by the same provider expressed as a percentage of the total number of funds within the same ABI sector in the market at year-end. The first lag of the variable is used in the regression ($Share_{i,t-1}$).

*ABI Share in Provider*

A wide range of products within a family is found to have negative effects on fund performance (Massa, 2003) which suggests that if a provider focuses on a particular style of investment better performance is expected. This can be related to the positive impact of specialization in a particular asset class. The degree of concentration on one style is measured by the share each ABI sector has within a provider's portfolio of funds. This is proxied by the ratio of number of funds with the same ABI sector as fund *i* operated by the same provider over all funds that the provider operates at the end of year *t*, expressed as a percentage. The first lag of the variable is used in the regression ($ABIshare_{i,t-1}$).

*Provider's Age*

Provider's age is used in order to approximate the provider's experience and status in the market (Khorana and Servaes, 2011). There are two possible effects on performance. In line with the main hypothesis, given that there is no past information to judge new providers on, young providers will need to present strong performance in order to build up their reputation. As more information becomes available the effort levels decrease and performance settles down at a lower level. Consequently, young providers may outperform older providers. On the other hand, older providers may have more experience with different investment styles as well as know more about managerial abilities, and so operate funds that perform better than funds of younger providers. Therefore, it is possible that older providers score higher performance than younger providers. These two effects may cancel each other out or one of the two may dominate depending on which one is stronger. Provider's age is measured as the number of years elapsed at year-end since the inception date of the provider's first fund in the market. Due to collinearity issues with the fund's age and provider's size this variable is broken down into four dummies, each taking the value 1 if the provider is from 0 to 5, 5 to 10, 10 to 15, and 15 to 20 years old at year-end. It should be noted that these dummies are not overlapping. The lower limit is in each case excluded, e.g. if a provider is exactly 5 years old the observation is included in the 0-5 group and not the 5-10 group. The oldest provider group (20+) is left out to avoid collinearity with the constant. The notation is $Provider\ age_{i,t} = \{p0\_5_{i,t}, p5\_10_{i,t}, p10\_15_{i,t}, p15\_20_{i,t}\}$.

*Interactions*

The model can be extended to include interactive terms between fund's age and other variables. First, fund's age is interacted with the bear and bull market dummies. Kempf et al. (2009) argue that managerial incentives differ during bear and bull markets. The difference between these two conditions is based on the expectations for managerial performance. Expectations are high during bull markets whereas during bear markets everyone is thought to be negatively affected and expectations are lower. This can be interpreted in the following way. If managers of young funds are putting in an extra effort under 'normal' economic conditions then this effort could be lessened in a bear market since poor performance may not be judged as harshly. If performance is a convex function of fund's age under normal conditions then it will be less steep under bear market conditions. So the interaction of fund age and the bear market dummy is expected to be positive. At the same time, the bar is set higher during bull markets and thus, managers of young funds will need to try even harder in order to be seen as able as everyone else to exploit the available opportunities. Therefore, the relationship between fund performance and fund's age will be steeper under bull market conditions, i.e. the interaction of fund age and the bull market dummy is expected to be negative.

The expected signs for these interactions can potentially be reversed. As discussed earlier, related literature shows that investors are more sensitive to poor performance the younger the fund is. Assuming that more assets are accumulated the older a fund becomes, even a small loss of assets can be detrimental for a young fund. Since poor performance and subsequent asset withdrawal are more likely to occur under bear market conditions, managers of young funds will put even more effort. This implies a steeper connection to fund's age and a negative coefficient for the interaction with the bear market dummy. Similarly, it may be easier for a young fund to look good during bull markets so effort can be lower than under normal economic conditions. This means a less steep connection to fund's age and a positive coefficient for the interaction with the bull market dummy.

Second, fund's age is interacted with provider's size to control whether fund performance of larger providers has a different relationship to fund's age than of smaller providers. A possible reason for this is the difference in resources available to larger providers. If there is increased effort for young funds then larger providers may be more successful in this since they can allocate more resources into the management of the fund e.g. more managers, faster and wider information collection etc. However, at the same time smaller providers have fewer funds to focus their attention on. Therefore, even if they have limited resources they can take proportionately more care of a newly opened fund and thus be more successful than large providers in making a new fund look good. This means that the interaction of fund's age and provider's size can have any of the two signs, depending on which effect dominates.

Finally, fund's age is interacted with each of the provider's age dummies in order to control whether funds of older providers perform differently with age than of younger providers. In line with the arguments for provider's age as a single variable in the regressions its interaction with fund's age can have a twofold effect. First, younger providers may try harder than older providers in order to build up their reputation so the performance of newly opened funds is expected to be higher for younger providers. On the other hand, providers accumulate experience and information the longer they have operated in the market. Consequently, older providers may be in a better position to judge how to manage the fund's portfolio, how to achieve high returns or ever how to exploit changing market conditions. So they can be more successful than younger providers in making a new fund shine. Both these effects imply that the interaction of fund's age and provider's age is negative. However, the first effect predicts the fund's age interaction with young providers to be more negative than that with old providers. The second effect predicts that the interaction with old providers is more negative than that with young providers. Again, depending on which effect is stronger, one of the two should be observed unless they cancel each other out.

*Regulatory Shocks*

Two additional variables are included in the model that control for regulatory shocks in this pension sector. As described in Chapter 2, the introduction of personal pension plans in 1988 and of stakeholder pension schemes in 2001 were two important changes in the industry. Two dummies are created, each taking the value 1 for years after 1988 and 2001 accordingly ($PPP_t$

and $STK_t$). The introduction of personal plans may be related to fund performance via market demand. Employees opting for personal plans may have preferred contributing to a fund that diversifies across asset classes instead of mixing funds specialising in one asset type (especially in view of the fees that the latter option would involve). This would imply an accumulation of assets for allocation funds which may make the difference in terms of performance. A similar result may be expected for fixed income or UK equity funds assuming that policyholders would feel 'safer' with this type of investment instead of e.g. emerging equity. The introduction of stakeholder schemes may have affected the performance of some fund types due to characteristics of such schemes. In particular, stakeholder schemes are characterised by restricted fees. If the investment style of a fund calls for costly information gathering or high transaction costs then an upper limit for fees means that managers are paid less for their effort. Thus, they may have fewer incentives to continue performing as well for such funds. If such an effect exists, it is expected to appear for emerging or international equity funds rather than UK equity or fixed income funds where information is (probably) less costly to gather.

To summarize, the regressions start with the constant only in order to assess whether there was statistically significant outperformance or underperformance. This serves as a confirmation of the results in the descriptive analysis. Then, the functions of fund's age and the provider's characteristics are added to form specification (2). This is followed by specification (3) with market conditions and the two regulatory change dummies. The last specification (4) adds all the interaction effects and is as follows[28]:

$$\begin{aligned}
&Performance_{i,t} = \\
&Constant + \gamma_1 f\left(age_{i,t}\right) + \gamma_2 Bear_{i,t} + \gamma_3 Bull_{i,t} + \gamma_4 Size_{i,t-1} + \gamma_5 Share_{i,t-1} + \\
&\gamma_6 ABIshare_{i,t-1} + \gamma_7 p0_5_{i,t} + \gamma_8 p5_10_{i,t} + \gamma_9 p10_15_{i,t} + \gamma_{10} p15_20_{i,t} + \gamma_{11} f\left(age_{i,t}\right) p0_5_{i,t} + \\
&\gamma_{12} f\left(age_{i,t}\right) p5_10_{i,t} + \gamma_{13} f(age_{i,t}) p10_15_{i,t} + \gamma_{14} f(age_{i,t}) p15_20_{i,t} + \gamma_{15} f(age_{i,t}) Size_{i,t-1} + \\
&\gamma_{16} f\left(age_{i,t}\right) Bear_{i,t} + \gamma_{17} f\left(age_{i,t}\right) Bull_{i,t} + \gamma_{18} PPP_t + \gamma_{19} STK_t + error \qquad (4)
\end{aligned}$$

[28] Note that specification (4) is carried out with all fund's age functions but not with the operation year dummies. The reason for this is the increase in multicollinearity when each operation year dummy is interacted with the provider's age and size as well as the market condition dummies.

Summary statistics for the individual explanatory variables (excluding the interactive terms) for all samples are provided in Appendix D in the columns under 'Unrestricted'.

### 3.3.2. Technical issues

One potential estimation problem is collinearity among the independent variables. Although OLS estimates remain unbiased – if other factors allow it – their variance can increase and affect their significance (Belsley, Kuh, and Welsch, 2004). For the chosen specifications, there is potential for high correlation particularly between the two market condition dummies as well as between the provider characteristic variables. Tables 3.3.A-G in Appendix E show the pairwise correlation coefficients for all variables in specification (3).

Fortunately, none of pairwise correlations has an absolute value of above 0.55. Obviously, the fund's age functions are highly correlated but this is not an issue given they are used alternatively. For all samples except fixed income funds the bear and the bull market dummies have a negative correlation that ranges circa between -0.45 and -0.55. This is expected as they represent 'opposite' market states. Provider size is positively correlated with the stakeholder dummy with a coefficient of about 0.45. This is not surprising as the longer a provider exists the more funds are opened and accumulated, especially by the end of the sample period where the stakeholder dummy equals one (after 2001). Understandably, provider size is also correlated with market share (particularly when at the same time other providers are opening funds with the same investment style).

Although correlations of about 0.5 are not remarkably high more advanced collinearity diagnostics are calculated. There are several parameters that can be calculated for this purpose, the main ones being the variance inflation factor (VIF), the condition number and the determinant of the correlation matrix of the explanatory variables. The VIF essentially shows to what degree the variance of the estimated coefficients is affected by collinearity. The condition number and the determinant of the correlation matrix indicate whether the coefficients can be estimated – which is not possible in case of perfect collinearity. There are no set thresholds of acceptable values, however, collinearity can be a problem when the mean

VIF is above 10, the condition number above 30, and the determinant close to zero (Belsley, Kuh, and Welsch, 2004). The values of these parameters for each of the samples are summarized in Table 3.4 with and without the interaction terms for specifications (3) and (4). Despite the correlation between provider size and the other variables as well as the market condition dummies, there is no collinearity when the interaction terms are not taken into account. This changes naturally when the interaction terms are included. The determinants are very close to zero (they appear as 0 due to rounding) and the condition numbers do not exceed 40 except for the allocation funds sample. Nevertheless, the coefficients can still be estimated. Moreover, none of the condition numbers is above 100, a range where collinearity is considered to significantly impair hypothesis testing.

Table 3.4. Collinearity diagnostics for specifications (3) and (4), i.e. with and without interaction terms for all samples.

**Collinearity Diagnostics***

| Sample | Specification | Mean VIF | Condition No | Determinant |
|---|---|---|---|---|
| **All Funds** | (3) | 1.28 | 31.690 | 0.2468 |
| | (4) | 3.33 | 34.879 | 0.0000 |
| **Allocation** | (3) | 1.46 | 75.509 | 0.1294 |
| | (4) | 4.03 | 83.362 | 0.0000 |
| **Fixed Income** | (3) | 1.37 | 24.593 | 0.1409 |
| | (4) | 3.38 | 27.331 | 0.0000 |
| **Equity** | (3) | 1.32 | 34.295 | 0.2188 |
| | (4) | 3.45 | 37.754 | 0.0000 |
| **Emerging Equity** | (3) | 1.55 | 17.836 | 0.1208 |
| | (4) | 4.71 | 20.997 | 0.0000 |
| **International Equity** | (3) | 1.38 | 36.220 | 0.1817 |
| | (4) | 3.60 | 40.339 | 0.0000 |
| **UK Equity** | (3) | 1.36 | 32.251 | 0.1850 |
| | (4) | 3.40 | 35.326 | 0.0000 |

*With $f(age_{i,t}) = age_{i,t}$ . Other age functions and provider age dummies produce very similar results.

The next technical issues relate to the panel structure of the sample. The first one to be addressed is testing for unit effects (Wooldridge, 2002). When unobserved unit effects are present in a panel the OLS estimator is biased and inconsistent. However, there are panel estimation methods that deal with this and their main difference relates to the correlation between the unit effects and the explanatory variables. Random effects estimation assumes that there is no correlation, whereas fixed effects estimation allows for it. If there is such correlation the random effects estimator is inconsistent. There is a method developed by Hausman (1978) which tests whether there is a systematic difference between the estimated coefficients of the random and fixed effects estimation. The Hausman test results are similar across different specifications and samples so for brevity reasons only those for the all-fund sample are presented here. Table 3.5 has the results of specification (4) with the linear age function. The Hausman null hypothesis that there is no systematic difference between the random and the fixed effect coefficients is strongly rejected. This difference is obvious by simple comparison as well therefore subsequent panel regressions are done with fund fixed effects.

The next problem concerns the estimated standard errors. Tests need to be carried out to ascertain the properties of the residuals and, in particular, test for homoscedasticity and correlation. Table 3.6 summarizes the regression results along with the diagnostic tests for specification (4). First, a simple fixed effects regression is shown (column 'FE'), then a fixed effects regression with clustering by fund to control for heteroscedasticity (column 'FE cluster') is presented, and last are the results for a fixed effects regression with standard errors which are robust to heteroscedasticity, autocorrelation, and spatial correlation (column 'FE Hoechle').

Group-wise heteroscedasticity is tested using the Lagrange multiplier method (Baum, 2001) with null hypothesis that of homoscedasticity. The chi-squared statistics of this test are strongly significant therefore heteroscedasticity is present. Autocorrelation is tested using the Wooldridge method (Drukker, 2003) with null hypothesis that there is no first-order autocorrelation. The Wooldridge F-statistic is also highly significant so there is also autocorrelation. This is also the case when standard errors are robust to heteroscedasticity as well (see 'FE cluster' column).

Apart from autocorrelation, another form of correlation might also be present, namely spatial correlation. This appears when there is correlation between the cross-sections of the panel (Wooldridge, 2002). There are methods to test for it (Hoyos and Sarafidis, 2006) but these cannot be carried out due to capacity constraints as the panel is unbalanced and there are too many cross-sections. Nevertheless, spatial correlation is considered common for panels with much more cross-sections than time periods – as is the case here – therefore the regressions are estimated again, this time using the Hoechle (2007) method which calculates Driscoll-Kraay standard errors (Driscoll and Kraay, 1998) for balanced and unbalanced panels. This method produces standard errors that are robust to heteroscedasticity, autocorrelation, and spatial correlation. These standard errors in column 'FE Hoechle' are considerably higher than those of simple and clustered robust fixed effects implying the presence of all three properties in the residuals. The Hoechle method with fund fixed effects is applied for all subsequent regression analysis in this chapter.

Table 3.5. Panel regression results and Hausman test for specification (4). All-funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The specification includes the linear age function. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| | Sharpe | | $R_{Fund}$-$R_{PPB}$ | | M2 | |
|---|---|---|---|---|---|---|
| | Random | Fixed | Random | Fixed | Random | Fixed |
| ***Constant*** | **0.0303** | **0.0881*** ** | **0.1504*** ** | **-0.0231** | **0.1575*** ** | **0.1285** ** |
| | (0.136) | (0.001) | (0.003) | (0.740) | (0.002) | (0.042) |
| $\boldsymbol{age_{i,t}}$ | **-0.0019** ** | **0.0005** | **-0.0020** | **-0.0061** | **-0.0040*** | **0.0035** |
| | (0.018) | (0.731) | (0.331) | (0.107) | (0.060) | (0.314) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.5567*** ** | **-0.5549*** ** | **-0.0421** ** | **0.0220** | **-0.1361*** ** | **-0.0760*** ** |
| | (0.000) | (0.000) | (0.028) | (0.293) | (0.000) | (0.000) |
| $\boldsymbol{Bull_{i,t}}$ | **0.0689*** ** | **0.0938*** ** | **0.0213** | **0.0918*** ** | **-0.2113*** ** | **-0.1365*** ** |
| | (0.000) | (0.000) | (0.212) | (0.000) | (0.000) | (0.000) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0222*** ** | **0.0408*** ** | **0.0178*** ** | **0.0688*** ** | **0.0473*** ** | **0.0693*** ** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| $\boldsymbol{Share_{i,t-1}}$ | **-0.0019*** ** | **-0.0004** | **0.0005** | **0.0036** ** | **-0.0043*** ** | **-0.0008** |
| | (0.000) | (0.538) | (0.560) | (0.037) | (0.000) | (0.588) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0040*** ** | **0.0004** | **0.0010** | **0.0123*** ** | **0.0047*** ** | **0.0148*** ** |
| | (0.000) | (0.745) | (0.336) | (0.000) | (0.000) | (0.000) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.0680** ** | **-0.1449*** ** | **-0.1032** | **-0.3797*** ** | **0.1723** ** | **-0.1201** |
| | (0.031) | (0.004) | (0.191) | (0.005) | (0.026) | (0.325) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.1221*** ** | **-0.0235** | **-0.0345** | **-0.4613*** ** | **0.2129*** ** | **-0.2081*** ** |
| | (0.000) | (0.420) | (0.490) | (0.000) | (0.000) | (0.003) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.0213** | **-0.0510** ** | **-0.0849** ** | **-0.2680*** ** | **-0.0443** | **-0.1376*** ** |
| | (0.204) | (0.020) | (0.042) | (0.000) | (0.287) | (0.009) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.0265*** | **0.0081** | **0.0535** | **-0.0439** | **0.0583*** | **0.0226** |
| | (0.051) | (0.605) | (0.113) | (0.292) | (0.076) | (0.551) |
| $\boldsymbol{age_{i,t} \cdot p0\_5_{i,t}}$ | **0.0053** | **0.0444*** ** | **0.0757** ** | **0.1016*** ** | **0.0040** | **0.0563*** |
| | (0.664) | (0.001) | (0.014) | (0.006) | (0.890) | (0.093) |
| $\boldsymbol{age_{i,t} \cdot p5\_10_{i,t}}$ | **-0.0097** ** | **0.0054** | **0.0035** | **0.0381*** ** | **-0.0302*** ** | **0.0199*** |
| | (0.019) | (0.255) | (0.736) | (0.003) | (0.002) | (0.083) |
| $\boldsymbol{age_{i,t} \cdot p10\_15_{i,t}}$ | **0.0086*** ** | **0.0078*** ** | **0.0157*** ** | **0.0184*** ** | **0.0151*** ** | **0.0167*** ** |
| | (0.000) | (0.002) | (0.005) | (0.006) | (0.006) | (0.006) |
| $\boldsymbol{age_{i,t} \cdot p15\_20_{i,t}}$ | **0.0020** | **0.0013** | **-0.0009** | **-0.0013** | **0.0010** | **-0.0008** |
| | (0.151) | (0.394) | (0.789) | (0.751) | (0.766) | (0.834) |
| $\boldsymbol{age_{i,t} \cdot Size_{i,t-1}}$ | **-0.0009*** ** | **-0.0014*** ** | **-0.0008** ** | **-0.0026*** ** | **-0.0013*** ** | **-0.0021*** ** |
| | (0.000) | (0.000) | (0.021) | (0.000) | (0.000) | (0.000) |
| $\boldsymbol{age_{i,t} \cdot Bear_{i,t}}$ | **0.0062*** ** | **0.0046*** ** | **0.0090*** ** | **0.0053** ** | **0.0094*** ** | **0.0055*** ** |
| | (0.000) | (0.000) | (0.000) | (0.017) | (0.000) | (0.006) |
| $\boldsymbol{age_{i,t} \cdot Bull_{i,t}}$ | **-0.0013*** | **-0.0030*** ** | **-0.0002** | **-0.0038** ** | **0.0040** ** | **-0.0006** |
| | (0.060) | (0.000) | (0.928) | (0.043) | (0.013) | (0.720) |
| $\boldsymbol{PPP_t}$ | **0.0070** | **-0.0656*** ** | **-0.0054** | **-0.0419** | **0.0285** | **-0.1115** ** |
| | (0.702) | (0.001) | (0.905) | (0.433) | (0.509) | (0.022) |
| $\boldsymbol{STK_t}$ | **0.0217*** ** | **-0.0229** ** | **-0.0377** ** | **-0.0511*** | **0.0084** | **-0.0687*** ** |
| | (0.003) | (0.027) | (0.034) | (0.064) | (0.646) | (0.006) |
| **$R^2$ overall** | 0.3025 | 0.2804 | 0.0035 | 0.0017 | 0.0293 | 0.0184 |
| **$R^2$ within** | 0.3962 | 0.4006 | 0.0048 | 0.0094 | 0.0202 | 0.0249 |
| **Wald/F-stat** | 14402.75 | 811.33 | 102.52 | 11.52 | 791.4 | 31.01 |
| **p-value** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Funds** | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 |
| **Observations** | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 |
| **Hausman** | **302.21** | | **200.63** | | **270.96** | |
| **p-value** | 0.0000 | | 0.0000 | | 0.0000 | |

Table 3.6. Panel regression results for the all-funds sample with heteroscedasticity and autocorrelation tests for specification (4). The PPB is the benchmark. The panel observations have a yearly frequency. The specification includes the linear age function. Standard errors are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | | |
|---|---|---|---|---|---|---|---|---|---|
| | FE | FE cluster | FE Hoechle | FE | FE cluster | FE Hoechle | FE | FE cluster | FE Hoechle |
| ***Constant*** | **0.0881*** ** | **0.0881*** ** | **0.0881** | **-0.0231** | **-0.0231** | **-0.0231** | **0.1285** ** | **0.1285** | **0.1285** |
| | (0.0262) | (0.0246) | (0.0979) | (0.0697) | (0.0941) | (0.3325) | (0.0632) | (0.0821) | (0.2648) |
| $age_{i,t}$ | **0.0005** | **0.0005** | **0.0005** | **-0.0061** | **-0.0061*** | **-0.0061** | **0.0035** | **0.0035** | **0.0035** |
| | (0.0014) | (0.0019) | (0.0102) | (0.0038) | (0.0032) | (0.0102) | (0.0034) | (0.0036) | (0.0107) |
| $Bear_{i,t}$ | **-0.5549*** ** | **-0.5549*** ** | **-0.5549*** ** | **0.0220** | **0.0220** | **0.0220** | **-0.0760*** ** | **-0.0760*** ** | **-0.0760** |
| | (0.0079) | (0.0089) | (0.0684) | (0.0209) | (0.0288) | (0.0460) | (0.0190) | (0.0241) | (0.0687) |
| $Bull_{i,t}$ | **0.0938*** ** | **0.0938*** ** | **0.0938** | **0.0918*** ** | **0.0918*** ** | **0.0918** | **-0.1365*** ** | **-0.1365*** ** | **-0.1365*** |
| | (0.0075) | (0.0098) | (0.0664) | (0.0198) | (0.0226) | (0.0839) | (0.0180) | (0.0223) | (0.0780) |
| $Size_{i,t-1}$ | **0.0408*** ** | **0.0408*** ** | **0.0408** ** | **0.0688*** ** | **0.0688*** ** | **0.0688*** | **0.0693*** ** | **0.0693*** ** | **0.0693*** |
| | (0.0029) | (0.0037) | (0.0198) | (0.0078) | (0.0084) | (0.0349) | (0.0070) | (0.0087) | (0.0360) |
| $Share_{i,t-1}$ | **-0.0004** | **-0.0004** | **-0.0004** | **0.0036** ** | **0.0036** | **0.0036** | **-0.0008** | **-0.0008** | **-0.0008** |
| | (0.0006) | (0.0007) | (0.0022) | (0.0017) | (0.0022) | (0.0028) | (0.0016) | (0.0019) | (0.0033) |
| $ABIshare_{i,t-1}$ | **0.0004** | **0.0004** | **0.0004** | **0.0123*** ** | **0.0123*** ** | **0.0123*** ** | **0.0148*** ** | **0.0148*** ** | **0.0148** ** |
| | (0.0011) | (0.0012) | (0.0027) | (0.0030) | (0.0045) | (0.0042) | (0.0028) | (0.0042) | (0.0071) |
| $p0\_5_{i,t}$ | **-0.1449*** ** | **-0.1449*** ** | **-0.1449** | **-0.3797*** ** | **-0.3797** ** | **-0.3797** | **-0.1201** | **-0.1201** | **-0.1201** |
| | (0.0506) | (0.0497) | (0.1222) | (0.1345) | (0.1755) | (0.2782) | (0.1220) | (0.1545) | (0.2656) |
| $p5\_10_{i,t}$ | **-0.0235** | **-0.0235** | **-0.0235** | **-0.4613*** ** | **-0.4613*** ** | **-0.4613*** ** | **-0.2081*** ** | **-0.2081** ** | **-0.2081** |
| | (0.0292) | (0.0298) | (0.0787) | (0.0776) | (0.0935) | (0.1462) | (0.0703) | (0.0956) | (0.1427) |
| $p10\_15_{i,t}$ | **-0.0510** ** | **-0.0510** ** | **-0.0510** | **-0.2680*** ** | **-0.2680*** ** | **-0.2680** ** | **-0.1376*** ** | **-0.1376** ** | **-0.1376** |
| | (0.0219) | (0.0247) | (0.0791) | (0.0583) | (0.0583) | (0.1205) | (0.0529) | (0.0569) | (0.1171) |
| $p15\_20_{i,t}$ | **0.0081** | **0.0081** | **0.0081** | **-0.0439** | **-0.0439** | **-0.0439** | **0.0226** | **0.0226** | **0.0226** |
| | (0.0157) | (0.0172) | (0.0479) | (0.0417) | (0.0336) | (0.0739) | (0.0379) | (0.0365) | (0.0565) |
| $age_{i,t} \cdot p0\_5_{i,t}$ | **0.0444*** ** | **0.0444*** ** | **0.0444** | **0.1016*** ** | **0.1016** ** | **0.1016** | **0.0563*** | **0.0563** | **0.0563** |
| | (0.0139) | (0.0130) | (0.0274) | (0.0369) | (0.0471) | (0.0668) | (0.0335) | (0.0404) | (0.0485) |
| $age_{i,t} \cdot p5\_10_{i,t}$ | **0.0054** | **0.0054** | **0.0054** | **0.0381*** ** | **0.0381** ** | **0.0381** ** | **0.0199*** | **0.0199** | **0.0199** |
| | (0.0048) | (0.0052) | (0.0090) | (0.0126) | (0.0165) | (0.0167) | (0.0115) | (0.0169) | (0.0168) |
| $age_{i,t} \cdot p10\_15_{i,t}$ | **0.0078*** ** | **0.0078*** ** | **0.0078** | **0.0184*** ** | **0.0184*** ** | **0.0184** ** | **0.0167*** ** | **0.0167*** ** | **0.0167*** |
| | (0.0025) | (0.0027) | (0.0046) | (0.0067) | (0.0063) | (0.0081) | (0.0061) | (0.0063) | (0.0091) |
| $age_{i,t} \cdot p15\_20_{i,t}$ | **0.0013** | **0.0013** | **0.0013** | **-0.0013** | **-0.0013** | **-0.0013** | **-0.0008** | **-0.0008** | **-0.0008** |
| | (0.0015) | (0.0015) | (0.0030) | (0.0041) | (0.0030) | (0.0042) | (0.0037) | (0.0032) | (0.0029) |
| $age_{i,t} \cdot Size_{i,t-1}$ | **-0.0014*** ** | **-0.0014*** ** | **-0.0014*** ** | **-0.0026*** ** | **-0.0026*** ** | **-0.0026** ** | **-0.0021*** ** | **-0.0021*** ** | **-0.0021** ** |
| | (0.0002) | (0.0002) | (0.0005) | (0.0005) | (0.0005) | (0.0012) | (0.0004) | (0.0005) | (0.0010) |
| $age_{i,t} \cdot Bear_{i,t}$ | **0.0046*** ** | **0.0046*** ** | **0.0046** | **0.0053** ** | **0.0053** ** | **0.0053** | **0.0055*** ** | **0.0055** ** | **0.0055** |
| | (0.0008) | (0.0010) | (0.0034) | (0.0022) | (0.0025) | (0.0034) | (0.0020) | (0.0022) | (0.0043) |
| $age_{i,t} \cdot Bull_{i,t}$ | **-0.0030*** ** | **-0.0030** ** | **-0.0030** | **-0.0038** ** | **-0.0038** ** | **-0.0038** | **-0.0006** | **-0.0006** | **-0.0006** |
| | (0.0007) | (0.0012) | (0.0030) | (0.0019) | (0.0019) | (0.0045) | (0.0017) | (0.0018) | (0.0046) |
| $PPP_t$ | **-0.0656*** ** | **-0.0656*** ** | **-0.0656** | **-0.0419** | **-0.0419** | **-0.0419** | **-0.1115** ** | **-0.1115*** | **-0.1115** |
| | (0.0201) | (0.0197) | (0.0868) | (0.0535) | (0.0736) | (0.2777) | (0.0485) | (0.0653) | (0.1950) |
| $STK_t$ | **-0.0229** ** | **-0.0229** ** | **-0.0229** | **-0.0511*** | **-0.0511*** | **-0.0511** | **-0.0687*** ** | **-0.0687*** ** | **-0.0687** |
| | (0.0104) | (0.0109) | (0.0887) | (0.0276) | (0.0268) | (0.1173) | (0.0250) | (0.0253) | (0.1142) |
| **$R^2$ within** | 0.4006 | 0.4006 | 0.4006 | 0.0094 | 0.0094 | 0.0094 | 0.0249 | 0.0249 | 0.0249 |
| **F-statistic** | 811.33 | 1541.03 | 109.56 | 11.52 | 9.37 | 35.82 | 31.01 | 26.39 | 71.71 |
| **p-value** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Wooldridge F-stat.** | 413.847 | 413.847 | | 77.943 | 77.943 | | 11.749 | 11.749 | |
| **p-value** | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0006 | 0.0006 | |
| **Wald Chi2** | 2.30E+36 | | | 3.20E+38 | | | 1.40E+37 | | |
| **p-value** | 0.0000 | | | 0.0000 | | | 0.0000 | | |

### 3.3.3. Results with the PPB as benchmark

In the first instance, fund performance measures are regressed on only the constant. This method estimates the average performance across all funds in each sample but more importantly it assesses the performance's significance with corrected standard errors (Driscoll-Kraay) and estimates (fund fixed effects). This type of regression does not explain any of the variance of the dependent variable and thus, $R^2$-within is 0 and the F-test for the significance of the regression cannot be calculated. Table 3.7 shows the estimated coefficients for the constant, the number of funds and observations in each sample.

Table 3.7. The estimated constant coefficient for specification (1), sorted by sample and performance measure. The $R^2$-within is in all cases 0 and the F-test for the significance of the regression is not applicable. The benchmark is the PPB and the panel has the yearly structure. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| | Constant Coefficient | | | | |
|---|---|---|---|---|---|
| **Sample** | **Sharpe** | **$R_{Fund}$-$R_{PPB}$** | **M2** | **Funds** | **Obs.** |
| All Funds | **0.0381** | **0.1775*** ** | **0.2216*** ** | 4909 | 28586 |
| | (0.597) | (0.000) | (0.000) | | |
| Allocation | **0.0800** | **0.2049*** ** | **0.2873*** ** | 320 | 1579 |
| | (0.464) | (0.007) | (0.003) | | |
| Fixed Income | **0.0009** | **0.2536*** ** | **0.2596*** ** | 705 | 4380 |
| | (0.989) | (0.004) | (0.000) | | |
| Equity | **0.0655** | **0.1688*** ** | **0.2235*** ** | 3571 | 21072 |
| | (0.405) | (0.000) | (0.000) | | |
| Emerging Equity | **0.2049*** | **0.1087*** | **0.2919*** | 183 | 714 |
| | (0.067) | (0.068) | (0.087) | | |
| International Equity | **0.0490** | **0.1538*** ** | **0.1946*** ** | 1892 | 11611 |
| | (0.398) | (0.001) | (0.007) | | |
| UK Equity | **0.0760** | **0.1937*** ** | **0.2562*** ** | 1496 | 8747 |
| | (0.479) | (0.000) | (0.000) | | |

The most striking result is that although funds are found to significantly outperform their PPBs their average Sharpe ratio is not significantly different from 0. The only notable exception is the sample of emerging equity funds that manage to have a significantly positive

Sharpe ratio at the 10% level. They are also the only sample where the performance against the PPB is significantly different from 0 at the 10% significance level whereas all others are significant at the 1% level. This is in line with the t-test results in the descriptive analysis, where the mean difference-in-returns and M2 of emerging equity funds are not significantly different from 0. Generally, Table 3.7 confirms Table 3.2 and, in particular, that the M2 risk-adjusted performance is higher than the difference-in-returns performance. As explained earlier, this is due to the fact that the difference between fund risk and PPB risk is smaller than the difference between fund return and PPB return so that on risk-adjusted terms funds perform better than their PPBs. Note that all effects discussed below will refer to annualised performance. For example, since the observations are based on average monthly returns an outperformance of 0.1775% in the all-funds sample implies an annualised outperformance of 2.15%. The risk-adjusted outperformance of 0.2216% is approximately 2.7% in annualised terms.

Out of the three large samples, the equity funds perform worse against their PPBs than the allocation and the fixed income funds. Still the differences are not more than 0.7%. Fixed income funds have the highest difference-in-returns outperformance at a level of 3% whereas allocation funds have the highest M2 measure at around 3.5%. Among the equity sub-samples, UK equity funds have the highest difference-in-returns outperformance at almost 2.4% whereas emerging equity funds have the highest M2 at 3.54%.

Although these results look very positive, particularly in comparison to the poor performance that previous research finds, one fact should be noted. Funds significantly outperform their PPBs but they do not have a significantly positive Sharpe ratio. This implies that there may be some benchmark selection issues, i.e. funds' portfolios tend to be diversified in a wider class of assets than those included in the chosen benchmarks to give a high probability of showing outperformance over the chosen benchmarks. This argument is consistent with the fact that when returns on portfolios were run against returns on their benchmarks (CAPM regressions) the estimated betas were consistently significantly lower than 1. This brings us back to the argument discussed earlier in Section 3.2.1 why a CAPM-like analysis is not suitable: given that portfolios contain assets from outside their benchmarks, benchmarks cannot serve as proxies for the market portfolios.

Tables 3.8.A-G report the regression results for specifications (2) to (4) using all available observations and the square root age function.[29] Table 3.8.A shows the estimation results for the all-funds sample and Tables 3.8.B-G show the estimation results for the subsamples of individual investment styles (i.e., allocation, fixed income, equity, emerging equity, international equity, and UK equity funds). Given that the results obtained for the individual investment styles samples differ significantly from each other, Tables 3.8.B-G are of main concern. However, for the completeness of the analysis the results for the all-funds sample (Table 3.8.A) are presented as well.

Before the explanatory power of the independent variables is discussed in detail it should be noted that there is no age function that provides the best fit across all specifications, although the explanatory power of the linear function regressions is in most cases the lowest one. The significance of the estimated coefficients is similar across all age functions, which strengthens the robustness of the findings. Replacing the fund's age functions with operation year dummies doesn't reveal any clear pattern except some cases of significant underperformance in the first year or outperformance in years 7 to 10 for equity funds. Moreover, controlling for market conditions and regulatory shocks improves greatly the regressions' explanatory power as seen from the R-squared and F-test of specifications (2) and (3). This improvement is stronger for the regressions with the Sharpe ratio with R-squared increasing from less than 1% to 40% in the all-funds sample.

There are considerable differences in the factors that explain fund performance across the sub-samples but there are some characteristics that are more or less common for all, or at least the majority, of the regressions. For instance, the significance of the constant term disappears in most cases. The allocation and emerging equity funds are the only styles that have significant constants for performance relative to the PPB. However, in contrast with the results in Table 3.7 the corresponding constants are negative. These results suggest that the independent variables capture characteristics of funds and their providers as well as market conditions that explain differences in the performance of investment styles.

[29] The results with the other age functions are reported in Appendix F. Parts F1, F2, and F3 have the results for the linear, logarithmic, and cubic root functions. Part F.4 shows the results for the operational year dummies. As a reminder, specification (4) is not carried out with these dummies due to the high multicollinearity that is created with the inclusion of the interactive terms.

The effect of market conditions is another common factor and can be briefly summarised in two points. First, the Sharpe ratio is more susceptible to market changes than the performance relative to the PPB. This explains the dramatic increase in the Sharpe regressions' R-squared when including the market condition dummies compared to a much more modest increase for the difference-in-returns and M2 regressions. Second, performance is affected by the bear markets more than it does by the bull markets. In more detail, the Sharpe ratio of all samples decreases by about 6 in years with a bear market. Emerging equity funds are worse hit with a decrease of 11 whereas fixed income funds are least hit with a decrease of 4.9. Additionally, the difference-in-returns is largely unaffected by market conditions but the M2 measure seems to decrease in both the bear and the bull markets, particularly for equity funds. The results for the Sharpe ratio suggest that the losses incurred in 'bad' years are not made up by gains in 'good' years. Moreover, funds lose relative to their PPBs (in risk-adjusted terms) when the PPB market is going through a bull period implying that managers not only lose in bear markets but also fail to exploit bull markets. These findings suggest the possibility that managers have poor timing skills, which is consistent with previous research.

The provider's size is positive and significant for all sub-samples except the UK equity funds. All three performance measures increase with size concurring with the argument in Chen et al. (2004) that larger providers have more resources available to them and can score higher fund performance than smaller providers. The effect differs across samples. For example, an additional 100 funds within a provider increases the difference-in-returns by about 4.9% for emerging equity funds, 3.6% for allocation and fixed income funds but only by 1.09% for international equity funds.  The negative sign in the UK equity sample is found for both the difference-in-returns and the M2, meaning that they are reduced with increasing size. With 100 more funds, the difference-in-returns decreases by roughly 0.84% and the M2 by 1.2%. According to Massa (2003) this can happen when providers focus more on size than performance as means to attract investors.

The provider's market share in each fund's ABI sector is insignificant for most samples. It has a negative effect on the Sharpe ratio of allocation funds (around -2.4) and on the difference-in-returns of emerging equity funds (around -0.12). In both cases the effect is rather small but it still indicates a potential lack of competition for these investment styles which may reduce incentives to perform and, consequently, drives down fund performance. At the same time, market share has a positive effect on the difference-in-returns performance of UK equity funds. Once more, the coefficient is rather low, with the difference-in-returns increasing by only about 0.18% if the provider increases his market share in UK equity funds by 1%. Still the result is robust and suggests that economies of scale for this investment style are created when a provider has many funds of this type in the market relative to other providers.

The ABI's share in the provider's fund portfolio is also insignificant for several subsamples. It positively covaries with the performance of international equity funds with both the difference-in-returns and the M2 increasing by about 0.24% with an extra 1% in that style's share. There is also a significantly negative effect on the Sharpe ratio of UK equity funds, i.e., if the share of UK equity funds within the provider's group of funds increases by 1% the Sharpe ratio will decrease by 0.17. This indicates that it pays off to specialise in international equity but not so for domestic equity. A possible explanation for this is that specialisation makes a difference for performance in 'special' cases where a lot of information is required (such as international markets) but there may be a point where too much specialisation in something that is not as 'special' (domestic investments) has an adverse effect on performance.

Finally, regulatory change has an effect on the performance but for specific investment styles. For allocation funds the introduction of personal pension plans has positively affected fund performance relative to PPB. Particularly the difference-in-returns is higher by 7.4% in the years after the change in regulation. This may be related to the demand for allocation funds, i.e. funds that diversify across asset classes may be more desirable that mixing funds that invest mainly in one asset type. Thus, the fast accumulation of assets for allocation funds post-1988 may have brought about higher performance. At the same time, managers anticipating that there would be higher demand for allocation funds may have increased their efforts to make such funds look better and exploit further this situation. The introduction of stakeholder schemes appears to have increased the Sharpe ratio of UK equity funds by 2.4 and decreased the performance relative to the PPB for international equity funds by approximately the same amount. Both results are consistent with the hypothesis that an introduction of fees' upper limit may have resulted in managers focusing on investment styles that require relatively less information gathering and, therefore, are less costly to run. This may well apply here assuming that the international equity markets require more effort than the domestic stock market.

Contrary to expectations there is only weak evidence that the fund's age explains performance. Significant coefficients are obtained in very few samples. First, the performance relative to the PPB of the fixed income funds has a negative relationship with fund's age, which is consistent with the main hypothesis. A fund that is 5 years old would be underperforming a 1-year-old fund by circe 2% whereas a 10-year-old fund would underperform the 5-year-old by 1.45%. The other case is the emerging equity sample where the Sharpe ratio increases with fund's age. A 10-year-old fund has a Sharpe ratio that is higher by 10 compared to a 5-year-old fund whose Sharpe ratio is in turn higher by 14 than that of a 1-year old emerging equity fund. Lastly, there is significance at the 10% for the M2 measure for emerging and international equity funds. The coefficient is positive at 3.6% and circa 1.2% respectively, but its significance is not robust across specifications.

Although these positive coefficients for fund's age do not correspond to the expected pattern they do not necessarily refute the main hypothesis. Bauer et al. (2005) find a similar result though in a different context. They study the performance of ethical mutual funds (a style that was then considered new) in comparison to that of more "conventional" mutual funds in Germany, the US, and the UK. Ethical funds are found to have a significantly lower performance than conventional funds after their opening and that this difference gradually diminishes. Bauer et al. conclude that ethical funds have a "catching-up phase, possibly due to learning". This argument of funds going through a catching-up phase may also apply here and doesn't exclude the possibility that managers put in more effort at the beginning of the fund's operation than later on. This estimated concave relationship means that performance increases fast for a short period and then settles at a higher level. Therefore, it may be that more effort is put at the beginning in order to catch up as fast as possible and as the fund becomes older there is less effort and performance settles.

Apart for the above cases there is no other evidence that fund's age alone covaries with performance, however, the significance of numerous interactive terms suggests that funds' age matters in combination with other factors. For instance, as the coefficients estimated for provider's size are consistently positive (with an exception of the UK equity funds), the interaction of fund's age and size has a consistently negative coefficient (again with the exception of the UK equity funds). This seems to suggest that the positive impact of size becomes less important as a fund gets older. For example, if one considers the allocation funds' sample and the linear age function it seems that an additional 100 funds would increase the difference-in-returns of a 1-year-old allocation fund by 3.6% but that of a 5 and 10-year old fund would be increased by roughly 2.18% and 1.45% respectively. There is also some evidence that older funds underperform less during bear markets (where the interactive term of the bear dummy and age is positive and significant), although in the case of the allocation funds the effect is opposite. Moreover, the older fixed income funds are the worse their performance is during the bull market times.

The age of the providers needs a word of explanation. As with the above discussed factors, it seems that the explanatory power of providers' age also varies among investment styles. Without the interactive terms provider's age seems to matter little for performance. In the case of allocation funds, 5 to 10-year-old providers seem to underperform their benchmarks relative to the other age groups in the range of 3.6-4.9% (for the difference-in-returns). Fixed income funds of providers that are up to 10 years old have a significantly lower M2 of about 3.6%. Last, 0 to 10-year-old providers of emerging equity funds have a significantly higher Sharpe ratio (the 0-5 group outperforms by 9,64 and the 10-15 group by 4.66). However, the inclusion of the interactions shows a much different picture. In the most general terms, if there is a period of relative underperformance it occurs between 5-15 years of provider's age when funds are compared against their benchmarks. The degree of underperformance depends on the investment style, for example for the difference-in-returns 5 to 10-year-old providers of international equity funds underperform the others by approximately 11.3% and 10 to 15 year old providers of UK equity funds underperform by 7.4%. In contrast, the youngest providers (0-5) of emerging equity funds show some ability to outperform their oldest colleagues by almost 12.7%.

The interactive terms of funds' age and provider's age show a quite complex picture. For each investment style, with an exception of the fixed income funds, there are some significant coefficients obtained for the interactive terms indicating that within each provider's age group young funds perform differently than old funds. In the case of the allocation funds the performance declines with age so that 0-5 and 15-20 year-old providers overall outperform the others by around 14.7% but this outperformance decreases the older their funds become (significantly negative interactions). In a similar way, equity funds of 5 to 15 year-old providers have a significantly lower difference-in-returns (8.7% for the 5-10 group and 4.9% for the 10-15 group) but this underperformance decreases with fund's age (positive interactions). This pattern is also clearly observable for the international and UK equity funds. Thus, these middle-aged providers may underperform the others but they slowly catch up with them.

These results suggest that the impact of provider's age has a pattern somewhat consistent with the argument behind the main hypothesis, although it is a bit more complicated than a simple prediction of the initial superior performance which lapses over time. Indeed, it seems that the impact of provider's age is U-shaped. That is, there is some evidence that the youngest providers' performance is statistically indifferent or even better than the performance of the oldest providers while the middle-age providers tend to statistically underperform the oldest funds. This pattern appears in different forms for all three investment styles, i.e. allocation, fixed income, and equity. One could also argue that this pattern is also consistent with the mean-reverting properties of performance. Under the Efficient Market Hypothesis it is impossible for a particular agent (or a group of agents) to outperform the market in a consistent way. So even if some period is characterised by outperformance, it will be followed by a period of underperformance. What is important here, however, is that this pattern becomes more obvious once the interactive terms are added, particularly for allocation and equity funds.

Overall, the results of specification (4) uncover many details by including the interactive terms. For example, the positive effect of provider's size is confirmed, but it's interaction with fund's age shows that this positive effect decreases with time. In another case, one can observe that for particularly for equity funds middle-aged providers underperform younger and older providers but they catch-up with time (positive interaction with fund's age). This result is not obvious from specifications (2) and (3) where provider's age seems to makes no real difference. Moreover, the interactions with the market dummies imply that funds handle bear and bull markets in different ways depending on how old they are (older funds lose less in a bear market and gain less in a bull market than young funds). In conclusion, these results are more informative than those of the simpler specifications, thus demonstrating the importance of including the interactive terms in the regression.

There are, however, some issues that may affect the reliability of these results. First, the results concerning provider's age may be spurious and reflect the fact that older providers have more observations of fund performance than younger providers rather than that any pattern exists. In order to deal with this issue, the regressions with the interactive terms are repeated under the restriction that the fund's age does not exceed 5 years for all age functions. The results for these restricted regressions are shown in Table 3.9.A for the all-funds, allocation, fixed income, and equity samples and Table 3.9.B shows the corresponding results for the three equity sub-samples, i.e. emerging, international, and UK equity. Both tables are to be found right below the unrestricted regressions discussed above in Tables 3.8.A-G. The results with the other age functions are reported in Appendix H. Summary statistics for the individual explanatory variables (excluding the interactive terms) for all samples under the restriction are provided in Appendix D in the columns under 'Restricted'.

Table 3.8.A. Results for the all-funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0584** | **0.0931** | **0.0451** | **-0.0402** | **0.0355** | **-0.0337** | **-0.1713** | **0.1220** | **0.0896** |
| | (0.786) | (0.289) | (0.615) | (0.730) | (0.911) | (0.921) | (0.335) | (0.629) | (0.749) |
| $f(age_{i,t})$ | **-0.0067** | **0.0285** | **0.0257** | **-0.0041** | **0.0251** | **0.0022** | **0.0368** | **0.0585** | **0.0408** |
| | (0.928) | (0.507) | (0.629) | (0.895) | (0.499) | (0.965) | (0.265) | (0.198) | (0.508) |
| $Bear_{i,t}$ | | **-0.5296*** ** | **-0.5751*** ** | | **0.0477** | **-0.0410** | | **-0.0446** | **-0.1362** |
| | | (0.000) | (0.000) | | (0.256) | (0.506) | | (0.430) | (0.157) |
| $Bull_{i,t}$ | | **0.0677** | **0.1194*** | | **0.0556** | **0.1152** | | **-0.1457** ** | **-0.1298** |
| | | (0.347) | (0.094) | | (0.362) | (0.255) | | (0.021) | (0.207) |
| $Size_{i,t-1}$ | **0.0148** | **0.0159** | **0.0517** ** | **0.0179** | **0.0219** | **0.1095** ** | **0.0432*** | **0.0325** | **0.0846** ** |
| | (0.603) | (0.249) | (0.016) | (0.290) | (0.239) | (0.017) | (0.068) | (0.142) | (0.043) |
| $Share_{i,t-1}$ | **0.0062** ** | **0.0007** | **-0.0005** | **0.0070** ** | **0.0061** ** | **0.0031** | **0.0004** | **0.0009** | **-0.0009** |
| | (0.026) | (0.750) | (0.809) | (0.024) | (0.036) | (0.293) | (0.919) | (0.784) | (0.788) |
| $ABIshare_{i,t-1}$ | **0.0014** | **0.0006** | **0.0002** | **0.0142*** ** | **0.0132*** ** | **0.0116*** ** | **0.0155** ** | **0.0148*** | **0.0138*** |
| | (0.675) | (0.813) | (0.947) | (0.002) | (0.002) | (0.005) | (0.042) | (0.054) | (0.067) |
| $p0\_5_{i,t}$ | **0.0621** | **0.0468** | **-0.1799** | **0.0997** | **0.0530** | **-0.4114** | **0.2766** | **0.1402** | **-0.0588** |
| | (0.803) | (0.659) | (0.240) | (0.600) | (0.752) | (0.262) | (0.157) | (0.458) | (0.856) |
| $p5\_10_{i,t}$ | **-0.0223** | **0.0593** | **0.0090** | **-0.1684** | **-0.2052** | **-0.6459*** ** | **0.0756** | **-0.0715** | **-0.2636** |
| | (0.914) | (0.473) | (0.947) | (0.319) | (0.137) | (0.008) | (0.551) | (0.575) | (0.278) |
| $p10\_15_{i,t}$ | **0.0226** | **0.0566** | **-0.0380** | **-0.0058** | **-0.0356** | **-0.3715** ** | **0.1234** | **0.0389** | **-0.1629** |
| | (0.890) | (0.414) | (0.764) | (0.945) | (0.671) | (0.039) | (0.185) | (0.677) | (0.415) |
| $p15\_20_{i,t}$ | **0.0130** | **0.0561** | **0.0131** | **0.0286** | **0.0039** | **-0.0561** | **0.1298*** | **0.0514** | **0.0422** |
| | (0.907) | (0.259) | (0.871) | (0.657) | (0.955) | (0.622) | (0.099) | (0.372) | (0.602) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.1379** ** | | | **0.2924** | | | **0.1229** |
| | | | (0.048) | | | (0.104) | | | (0.290) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0208** | | | **0.2088*** ** | | | **0.0883** |
| | | | (0.700) | | | (0.010) | | | (0.313) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0311** | | | **0.1136** ** | | | **0.0685** |
| | | | (0.345) | | | (0.018) | | | (0.246) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.0117** | | | **0.0095** | | | **-0.0046** |
| | | | (0.581) | | | (0.740) | | | (0.829) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0091** ** | | | **-0.0223** ** | | | **-0.0134** ** |
| | | | (0.029) | | | (0.015) | | | (0.038) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0223** | | | **0.0432** ** | | | **0.0421** |
| | | | (0.258) | | | (0.046) | | | (0.144) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0192** | | | **-0.0215** | | | **-0.0049** |
| | | | (0.312) | | | (0.364) | | | (0.863) |
| $PPP_t$ | | **-0.0713** | **-0.0738** | | **-0.0681** | **-0.0834** | | **-0.1244** | **-0.1278** |
| | | (0.376) | (0.360) | | (0.809) | (0.764) | | (0.531) | (0.516) |
| $STK_t$ | | **-0.0499** | **-0.0329** | | **-0.1302** | **-0.0782** | | **-0.1080** | **-0.0796** |
| | | (0.528) | (0.691) | | (0.190) | (0.464) | | (0.308) | (0.473) |
| $R^2$ within | 0.0063 | 0.3970 | 0.4008 | 0.0046 | 0.0064 | 0.0106 | 0.0145 | 0.0236 | 0.0256 |
| F-statistic | 1.9464 | 28.4626 | 137.3760 | 2.0905 | 1.5968 | 156.8246 | 1.0329 | 4.8186 | 45.6055 |
| p-value | 0.0921 | 0.0000 | 0.0000 | 0.0713 | 0.1496 | 0.0000 | 0.4355 | 0.0003 | 0.0000 |
| Funds | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 |
| Observations | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 |

Table 3.8.B. Results for the allocation funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0774** | **0.0045** | **-0.1424** | **0.1262** | **-0.7888**** | **-1.4234***** | **-0.1850** | **-0.5391**** | **-0.7227**** |
| | (0.766) | (0.975) | (0.302) | (0.609) | (0.010) | (0.000) | (0.511) | (0.018) | (0.049) |
| $f(age_{i,t})$ | **-0.0573** | **-0.0465** | **-0.0351** | **-0.0720** | **-0.0966** | **0.0379** | **0.0542** | **0.0331** | **0.1095** |
| | (0.576) | (0.372) | (0.613) | (0.313) | (0.188) | (0.765) | (0.431) | (0.730) | (0.538) |
| $Bear_{i,t}$ | | **-0.6507***** | **-0.6067***** | | **0.3542***** | **0.5966***** | | **-0.0528** | **-0.0213** |
| | | (0.000) | (0.000) | | (0.002) | (0.000) | | (0.664) | (0.938) |
| $Bull_{i,t}$ | | **-0.0340** | **-0.0123** | | **0.3045** | **0.4127*** | | **-0.1011** | **-0.2102** |
| | | (0.770) | (0.924) | | (0.130) | (0.092) | | (0.506) | (0.457) |
| $Size_{i,t-1}$ | **0.0530** | **0.0406** | **0.1346***** | **0.0664*** | **0.1127*** | **0.3174***** | **0.0850**** | **0.0707** | **0.0841** |
| | (0.301) | (0.111) | (0.005) | (0.090) | (0.089) | (0.001) | (0.035) | (0.111) | (0.145) |
| $Share_{i,t-1}$ | **-0.0003** | **-0.0133** | **-0.0182*** | **-0.0359**** | **-0.0446** | **-0.0485*** | **-0.0289** | **-0.0195** | **-0.0143** |
| | (0.982) | (0.188) | (0.090) | (0.019) | (0.107) | (0.100) | (0.118) | (0.290) | (0.447) |
| $ABIshare_{i,t-1}$ | **0.0109** | **0.0201** | **0.0180** | **0.0293** | **0.0410** | **0.0367** | **0.0229** | **0.0153** | **0.0120** |
| | (0.628) | (0.166) | (0.190) | (0.413) | (0.363) | (0.404) | (0.475) | (0.648) | (0.716) |
| $p0\_5_{i,t}$ | **0.0116** | **0.1112** | **0.4167** | **-0.2139** | **-0.1133** | **1.0310** | **0.3754** | **0.4380*** | **1.1400*** |
| | (0.971) | (0.251) | (0.408) | (0.311) | (0.560) | (0.109) | (0.101) | (0.058) | (0.058) |
| $p5\_10_{i,t}$ | **-0.0947** | **0.0971** | **-0.0892** | **-0.5308*** | **-0.4171*** | **-0.2715** | **0.0368** | **0.1266** | **0.3298** |
| | (0.724) | (0.429) | (0.590) | (0.059) | (0.091) | (0.473) | (0.823) | (0.450) | (0.486) |
| $p10\_15_{i,t}$ | **-0.0016** | **0.0947** | **-0.1230** | **0.0084** | **0.0767** | **0.6664** | **0.3253*** | **0.3417**** | **1.1597*** |
| | (0.991) | (0.207) | (0.555) | (0.971) | (0.691) | (0.245) | (0.057) | (0.032) | (0.074) |
| $p15\_20_{i,t}$ | **0.0403** | **0.0667** | **0.1875** | **-0.0438** | **0.1092** | **0.7535**** | **0.2378** | **0.2398*** | **1.0435***** |
| | (0.823) | (0.422) | (0.269) | (0.720) | (0.489) | (0.021) | (0.106) | (0.067) | (0.005) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **-0.2026** | | | **-0.8935**** | | | **-0.6822**** |
| | | | (0.443) | | | (0.019) | | | (0.011) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0708** | | | **-0.2255** | | | **-0.2869** |
| | | | (0.412) | | | (0.343) | | | (0.269) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0553** | | | **-0.3592** | | | **-0.4432** |
| | | | (0.537) | | | (0.113) | | | (0.113) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.0657** | | | **-0.3127***** | | | **-0.3642**** |
| | | | (0.293) | | | (0.010) | | | (0.025) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0261***** | | | **-0.0622***** | | | **-0.0111** |
| | | | (0.001) | | | (0.000) | | | (0.550) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **-0.0187** | | | **-0.1088**** | | | **-0.0191** |
| | | | (0.235) | | | (0.036) | | | (0.834) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0097** | | | **-0.0462** | | | **0.0464** |
| | | | (0.662) | | | (0.425) | | | (0.615) |
| $PPP_t$ | | **0.0009** | **-0.0082** | | **0.5577** | **0.6397*** | | **0.3946** | **0.4994*** |
| | | (0.996) | (0.956) | | (0.127) | (0.054) | | (0.168) | (0.076) |
| $STK_t$ | | **0.1236** | **0.1593** | | **-0.0602** | **0.0060** | | **0.1341** | **0.1225** |
| | | (0.315) | (0.177) | | (0.800) | (0.979) | | (0.584) | (0.604) |
| $R^2$ within | 0.0251 | 0.5051 | 0.5133 | 0.0189 | 0.0501 | 0.0655 | 0.0432 | 0.0465 | 0.0577 |
| F-statistic | 1.1666 | 47.8421 | 135.5341 | 2.7425 | 24.3894 | 94.2351 | 2.1091 | 5.7026 | 81.7410 |
| p-value | 0.3600 | 0.0000 | 0.0000 | 0.0277 | 0.0000 | 0.0000 | 0.0773 | 0.0002 | 0.0000 |
| Funds | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 |
| Observations | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 |

Table 3.8.C. Results for the fixed income funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0151** | **-0.0128** | **-0.1121** | **0.2215** | **0.2684** | **-0.0052** | **0.3267** | **0.3189** | **0.1262** |
| | (0.947) | (0.940) | (0.534) | (0.456) | (0.513) | (0.991) | (0.157) | (0.160) | (0.647) |
| $f(age_{i,t})$ | **-0.0605** | **0.0104** | **0.0115** | **-0.1534*** ** | **-0.1636** ** | **-0.1358*** | **-0.1413*** ** | **-0.1721*** ** | **-0.1526** ** |
| | (0.248) | (0.914) | (0.913) | (0.009) | (0.019) | (0.054) | (0.005) | (0.005) | (0.015) |
| $Bear_{i,t}$ | | **-0.2565** ** | **-0.4164** ** | | **0.1051** | **-0.0730** | | **0.1980*** ** | **0.1825** |
| | | (0.032) | (0.012) | | (0.371) | (0.730) | | (0.002) | (0.204) |
| $Bull_{i,t}$ | | **0.1294** | **0.1662** | | **-0.0392** | **0.1603** | | **-0.0864*** | **0.0810** |
| | | (0.255) | (0.181) | | (0.512) | (0.231) | | (0.058) | (0.383) |
| $Size_{i,t-1}$ | **0.0401*** | **0.0556*** ** | **0.1444*** ** | **0.0859** ** | **0.0804** ** | **0.3045** ** | **0.0689** ** | **0.0594*** | **0.2452** ** |
| | (0.065) | (0.006) | (0.003) | (0.039) | (0.039) | (0.047) | (0.036) | (0.059) | (0.017) |
| $Share_{i,t-1}$ | **0.0042*** | **0.0031** | **0.0007** | **0.0017** | **0.0017** | **-0.0037** | **-0.0008** | **-0.0006** | **-0.0049** |
| | (0.067) | (0.214) | (0.803) | (0.793) | (0.789) | (0.481) | (0.873) | (0.908) | (0.251) |
| $ABIshare_{i,t-1}$ | **0.0030** | **-0.0068** | **-0.0117** | **0.0301** | **0.0289** | **0.0130** | **0.0174** | **0.0176** | **0.0015** |
| | (0.867) | (0.509) | (0.247) | (0.257) | (0.221) | (0.527) | (0.320) | (0.300) | (0.907) |
| $p0\_5_{i,t}$ | **-0.2885*** | **-0.1055** | **-0.4085** | **-0.1505** | **-0.2120** | **-0.4492** | **-0.1900** | **-0.2753*** | **-0.8555** |
| | (0.079) | (0.525) | (0.166) | (0.331) | (0.276) | (0.493) | (0.134) | (0.094) | (0.167) |
| $p5\_10_{i,t}$ | **-0.1669** | **-0.0229** | **0.1047** | **-0.2649** | **-0.3196** | **-0.3797** | **-0.2289** ** | **-0.3040** ** | **-0.5869** ** |
| | (0.217) | (0.860) | (0.645) | (0.428) | (0.192) | (0.244) | (0.042) | (0.013) | (0.030) |
| $p10\_15_{i,t}$ | **-0.1065** | **-0.0324** | **-0.0406** | **-0.0205** | **-0.0580** | **-0.2708** | **-0.0143** | **-0.0735** | **-0.3070** |
| | (0.211) | (0.719) | (0.801) | (0.836) | (0.638) | (0.460) | (0.873) | (0.506) | (0.223) |
| $p15\_20_{i,t}$ | **-0.0426** | **0.0211** | **-0.0049** | **0.0377** | **-0.0010** | **0.0106** | **0.0505** | **-0.0200** | **-0.0050** |
| | (0.643) | (0.805) | (0.978) | (0.657) | (0.983) | (0.926) | (0.463) | (0.673) | (0.965) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.1923** | | | **0.1793** | | | **0.3762** |
| | | | (0.112) | | | (0.570) | | | (0.214) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **-0.0584** | | | **0.0278** | | | **0.1249** |
| | | | (0.447) | | | (0.818) | | | (0.229) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **-0.0051** | | | **0.0568** | | | **0.0658** |
| | | | (0.907) | | | (0.544) | | | (0.317) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.0024** | | | **-0.0225** | | | **-0.0213** |
| | | | (0.958) | | | (0.554) | | | (0.542) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0238*** ** | | | **-0.0597*** | | | **-0.0490** ** |
| | | | (0.007) | | | (0.056) | | | (0.015) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0668*** | | | **0.0767** | | | **0.0098** |
| | | | (0.056) | | | (0.178) | | | (0.801) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0107** | | | **-0.0687** ** | | | **-0.0589** ** |
| | | | (0.633) | | | (0.042) | | | (0.023) |
| $PPP_t$ | | **-0.0841** | **-0.0815** | | **0.0264** | **0.0022** | | **0.1453** | **0.1049** |
| | | (0.567) | (0.585) | | (0.936) | (0.995) | | (0.325) | (0.458) |
| $STK_t$ | | **-0.1695** | **-0.1326** | | **-0.0190** | **0.0688** | | **-0.0103** | **0.0668** |
| | | (0.363) | (0.467) | | (0.867) | (0.417) | | (0.920) | (0.443) |
| $R^2$ within | 0.0149 | 0.1126 | 0.1258 | 0.0171 | 0.0199 | 0.0332 | 0.0163 | 0.0328 | 0.0458 |
| F-statistic | 5.6517 | 10.8576 | 27.1098 | 8.1720 | 9.8363 | 20.9964 | 16.6750 | 8.8053 | 18.2294 |
| p-value | 0.0003 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 |
| Observations | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 |

Table 3.8.D. Results for the equity funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0201** | **0.1443** | **0.1521** | **-0.1455** | **-0.1106** | **-0.0396** | **-0.3030*** | **0.0346** | **0.0855** |
| | (0.931) | (0.133) | (0.126) | (0.234) | (0.748) | (0.911) | (0.076) | (0.914) | (0.804) |
| $f(age_{i,t})$ | **-0.0043** | **0.0130** | **-0.0076** | **0.0282** | **0.0589** | **0.0133** | **0.0763*** | **0.1004**** | **0.0781** |
| | (0.959) | (0.704) | (0.855) | (0.391) | (0.109) | (0.786) | (0.053) | (0.038) | (0.230) |
| $Bear_{i,t}$ | | **-0.5789***** | **-0.6423***** | | **-0.0140** | **-0.1453** | | **-0.0906** | **-0.1987*** |
| | | (0.000) | (0.000) | | (0.837) | (0.166) | | (0.177) | (0.086) |
| $Bull_{i,t}$ | | **0.0515** | **0.0423** | | **0.0363** | **0.0356** | | **-0.1984***** | **-0.1896** |
| | | (0.498) | (0.577) | | (0.546) | (0.710) | | (0.005) | (0.116) |
| $Size_{i,t-1}$ | **0.0116** | **0.0092** | **0.0331*** | **0.0042** | **0.0076** | **0.0449** | **0.0419**** | **0.0262** | **0.0337** |
| | (0.668) | (0.301) | (0.074) | (0.749) | (0.543) | (0.138) | (0.040) | (0.132) | (0.337) |
| $Share_{i,t-1}$ | **0.0108**** | **0.0024** | **0.0011** | **0.0103**** | **0.0086*** | **0.0061** | **-0.0039** | **-0.0020** | **-0.0028** |
| | (0.029) | (0.428) | (0.700) | (0.031) | (0.050) | (0.167) | (0.482) | (0.679) | (0.551) |
| $ABIshare_{i,t-1}$ | **-0.0024** | **-0.0025** | **-0.0025** | **0.0187**** | **0.0189**** | **0.0183**** | **0.0214***** | **0.0229***** | **0.0226***** |
| | (0.643) | (0.543) | (0.540) | (0.015) | (0.019) | (0.016) | (0.002) | (0.004) | (0.004) |
| $p0\_5_{i,t}$ | **0.0991** | **0.0403** | **-0.1402** | **0.1500** | **0.1137** | **-0.4087** | **0.4104*** | **0.2619** | **0.1600** |
| | (0.719) | (0.666) | (0.294) | (0.501) | (0.578) | (0.243) | (0.065) | (0.179) | (0.616) |
| $p5\_10_{i,t}$ | **-0.0460** | **0.0211** | **-0.0595** | **-0.1635** | **-0.1946** | **-0.7011**** | **0.1536** | **-0.0114** | **-0.1449** |
| | (0.840) | (0.766) | (0.600) | (0.300) | (0.179) | (0.018) | (0.280) | (0.929) | (0.607) |
| $p10\_15_{i,t}$ | **-0.0011** | **0.0228** | **-0.0961** | **-0.0432** | **-0.0825** | **-0.4448**** | **0.1342** | **0.0422** | **-0.1693** |
| | (0.995) | (0.755) | (0.446) | (0.689) | (0.456) | (0.042) | (0.218) | (0.688) | (0.476) |
| $p15\_20_{i,t}$ | **-0.0153** | **0.0257** | **-0.0306** | **0.0213** | **-0.0115** | **-0.0803** | **0.1699**** | **0.0716** | **0.0450** |
| | (0.895) | (0.538) | (0.599) | (0.780) | (0.892) | (0.496) | (0.035) | (0.206) | (0.620) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.1111*** | | | **0.3338*** | | | **0.0651** |
| | | | (0.058) | | | (0.064) | | | (0.629) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0366** | | | **0.2514**** | | | **0.0682** |
| | | | (0.437) | | | (0.024) | | | (0.532) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0432** | | | **0.1329**** | | | **0.0829** |
| | | | (0.182) | | | (0.022) | | | (0.256) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.0179** | | | **0.0175** | | | **0.0072** |
| | | | (0.240) | | | (0.593) | | | (0.812) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0057** | | | **-0.0087** | | | **-0.0016** |
| | | | (0.123) | | | (0.226) | | | (0.826) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0286*** | | | **0.0596*** | | | **0.0478** |
| | | | (0.058) | | | (0.059) | | | (0.180) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **0.0046** | | | **0.0017** | | | **-0.0030** |
| | | | (0.748) | | | (0.952) | | | (0.936) |
| $PPP_t$ | | **-0.0304** | **-0.0311** | | **0.0102** | **-0.0181** | | **-0.1375** | **-0.1474** |
| | | (0.705) | (0.696) | | (0.972) | (0.950) | | (0.609) | (0.581) |
| $STK_t$ | | **0.0036** | **0.0176** | | **-0.1511** | **-0.1191** | | **-0.1142** | **-0.1065** |
| | | (0.958) | (0.808) | | (0.151) | (0.292) | | (0.305) | (0.362) |
| $R^2$ within | 0.0097 | 0.5414 | 0.5439 | 0.0067 | 0.0094 | 0.0132 | 0.0240 | 0.0408 | 0.0424 |
| F-statistic | 1.4904 | 33.8074 | 197.2943 | 1.9858 | 1.6299 | 14.9130 | 2.2555 | 16.3828 | 24.8715 |
| p-value | 0.2053 | 0.0000 | 0.0000 | 0.0859 | 0.1397 | 0.0000 | 0.0533 | 0.0000 | 0.0000 |
| Funds | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 |
| Observations | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 |

Table 3.8.E. Results for the emerging equity funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | -0.5431 | -0.2945 | -0.2366 | -0.5661* | -0.3235 | -0.9272*** | -1.1225** | -0.2678 | -0.7126*** |
| | (0.107) | (0.144) | (0.210) | (0.076) | (0.190) | (0.008) | (0.013) | (0.339) | (0.008) |
| $f(age_{i,t})$ | 0.0669 | 0.2043*** | 0.2041** | 0.1078 | 0.2619 | 0.2308 | 0.1563 | 0.3246* | 0.2418 |
| | (0.649) | (0.005) | (0.023) | (0.231) | (0.140) | (0.294) | (0.260) | (0.082) | (0.286) |
| $Bear_{i,t}$ | | -0.8005*** | -0.9028*** | | -0.0623 | -0.1949 | | -0.4490*** | -0.5863*** |
| | | (0.000) | (0.000) | | (0.365) | (0.338) | | (0.000) | (0.007) |
| $Bull_{i,t}$ | | 0.0623 | 0.1364** | | 0.2948 | 0.5989* | | -0.1692 | 0.0140 |
| | | (0.311) | (0.028) | | (0.123) | (0.087) | | (0.420) | (0.964) |
| $Size_{i,t-1}$ | 0.0869* | 0.0223* | -0.0154 | 0.0627** | 0.0564** | 0.3951*** | 0.1730*** | 0.1326*** | 0.4266*** |
| | (0.066) | (0.057) | (0.668) | (0.016) | (0.019) | (0.000) | (0.001) | (0.001) | (0.000) |
| $Share_{i,t-1}$ | 0.0159*** | 0.0014 | 0.0027 | 0.0063 | 0.0005 | -0.0163* | 0.0109 | 0.0048 | -0.0108 |
| | (0.004) | (0.535) | (0.397) | (0.263) | (0.931) | (0.059) | (0.154) | (0.486) | (0.247) |
| $ABIshare_{i,t-1}$ | -0.0059 | 0.0252** | 0.0269** | 0.0325 | 0.0369 | 0.0350 | 0.0431 | 0.0344 | 0.0375 |
| | (0.595) | (0.030) | (0.034) | (0.333) | (0.301) | (0.156) | (0.230) | (0.209) | (0.116) |
| $p0\_5_{i,t}$ | 0.1928 | 0.7741*** | 0.5966** | 0.2638 | 0.3282 | 0.9872* | 0.3687 | 0.4643 | 0.9285 |
| | (0.600) | (0.000) | (0.015) | (0.681) | (0.593) | (0.070) | (0.667) | (0.470) | (0.111) |
| $p5\_10_{i,t}$ | -0.2924 | 0.6208*** | -0.5616 | -0.4496 | -0.1571 | -1.9687 | 0.0057 | 0.1097 | -2.2171 |
| | (0.525) | (0.001) | (0.251) | (0.435) | (0.788) | (0.227) | (0.994) | (0.866) | (0.325) |
| $p10\_15_{i,t}$ | -0.3696 | 0.3810* | 0.3442 | -0.4955 | -0.4250 | -0.4109 | -0.4990 | -0.5385 | -1.1060** |
| | (0.359) | (0.065) | (0.148) | (0.264) | (0.349) | (0.533) | (0.354) | (0.159) | (0.022) |
| $p15\_20_{i,t}$ | -0.1586 | 0.1641 | 0.1566 | -0.3768 | -0.4439** | -0.4833 | -0.2309 | -0.5207** | -0.6670 |
| | (0.450) | (0.452) | (0.641) | (0.102) | (0.034) | (0.238) | (0.572) | (0.016) | (0.178) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | 0.1990 | | | -0.3489* | | | -0.0305 |
| | | | (0.280) | | | (0.055) | | | (0.838) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | 0.8196** | | | 1.5104 | | | 1.8856 |
| | | | (0.020) | | | (0.109) | | | (0.170) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | 0.0047 | | | 0.1392 | | | 0.4102*** |
| | | | (0.929) | | | (0.596) | | | (0.007) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | -0.0003 | | | 0.0281 | | | 0.0671 |
| | | | (0.997) | | | (0.885) | | | (0.769) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | 0.0108 | | | -0.0962*** | | | -0.0830*** |
| | | | (0.303) | | | (0.001) | | | (0.002) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | 0.0529 | | | 0.1238 | | | 0.1124 |
| | | | (0.321) | | | (0.187) | | | (0.316) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | -0.0382 | | | -0.1200 | | | -0.0701 |
| | | | (0.310) | | | (0.212) | | | (0.437) |
| $PPP_t$ | | | | | | | | | |
| $STK_t$ | | 0.0281 | 0.0327 | | -0.5977 | -0.4814 | | -0.6995 | -0.5660 |
| | | (0.873) | (0.862) | | (0.177) | (0.164) | | (0.172) | (0.209) |
| $R^2$ within | 0.1265 | 0.7971 | 0.8066 | 0.0524 | 0.0879 | 0.1400 | 0.2158 | 0.2885 | 0.3311 |
| F-statistic | 18.1536 | 395.3173 | 1958863.2088 | 25.8431 | 290.2517 | 358.1669 | 5.2320 | 39.8612 | 12185.6419 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0011 | 0.0000 | 0.0000 |
| Funds | 183 | 183 | 183 | 183 | 183 | 183 | 183 | 183 | 183 |
| Observations | 713 | 713 | 713 | 713 | 713 | 713 | 713 | 713 | 713 |

Table 3.8.F. Results for the international equity funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.1918** | **0.0899** | **0.1002** | **-0.4424**** | **-0.4974** | **-0.3790** | **-0.4864**** | **0.0097** | **0.0650** |
| | (0.405) | (0.401) | (0.428) | (0.015) | (0.144) | (0.258) | (0.013) | (0.975) | (0.825) |
| $f(age_{i,t})$ | **0.0073** | **0.0383** | **0.0280** | **0.0332** | **0.0726** | **0.0380** | **0.0580** | **0.0997*** | **0.0959** |
| | (0.908) | (0.295) | (0.569) | (0.523) | (0.156) | (0.550) | (0.216) | (0.065) | (0.161) |
| $Bear_{i,t}$ | | **-0.4435***** | **-0.4910***** | | **-0.1130** | **-0.2865** | | **-0.2529**** | **-0.3785***** |
| | | (0.000) | (0.000) | | (0.430) | (0.118) | | (0.024) | (0.005) |
| $Bull_{i,t}$ | | **0.1173*** | **0.1226** | | **0.0288** | **0.0431** | | **-0.2277***** | **-0.1698*** |
| | | (0.081) | (0.103) | | (0.729) | (0.499) | | (0.008) | (0.052) |
| $Size_{i,t-1}$ | **0.0129** | **0.0184*** | **0.0459** | **0.0270** | **0.0343**** | **0.0933**** | **0.0699**** | **0.0503***** | **0.0815**** |
| | (0.564) | (0.058) | (0.107) | (0.216) | (0.028) | (0.041) | (0.011) | (0.003) | (0.011) |
| $Share_{i,t-1}$ | **0.0082** | **-0.0017** | **-0.0044** | **0.0289*** | **0.0233*** | **0.0164** | **-0.0013** | **0.0016** | **-0.0022** |
| | (0.367) | (0.737) | (0.412) | (0.062) | (0.078) | (0.257) | (0.931) | (0.899) | (0.858) |
| $ABIshare_{i,t-1}$ | **0.0171*** | **0.0061** | **0.0054** | **0.0339***** | **0.0265**** | **0.0227**** | **0.0379***** | **0.0272**** | **0.0246**** |
| | (0.059) | (0.157) | (0.216) | (0.004) | (0.026) | (0.031) | (0.004) | (0.022) | (0.019) |
| $p0\_5_{i,t}$ | **0.0857** | **0.0218** | **-0.1916** | **-0.0570** | **-0.0568** | **-0.4909** | **0.2565** | **0.1355** | **0.0229** |
| | (0.702) | (0.797) | (0.370) | (0.840) | (0.844) | (0.372) | (0.304) | (0.571) | (0.969) |
| $p5\_10_{i,t}$ | **-0.0069** | **0.0289** | **-0.1059** | **-0.2129** | **-0.2360** | **-0.9094**** | **0.0732** | **-0.0743** | **-0.5513*** |
| | (0.968) | (0.661) | (0.436) | (0.307) | (0.270) | (0.018) | (0.623) | (0.621) | (0.087) |
| $p10\_15_{i,t}$ | **0.0374** | **0.0265** | **-0.0198** | **0.0053** | **-0.0518** | **-0.1685** | **0.1886** | **0.0927** | **0.1548** |
| | (0.818) | (0.711) | (0.904) | (0.974) | (0.750) | (0.578) | (0.136) | (0.416) | (0.625) |
| $p15\_20_{i,t}$ | **0.0117** | **0.0128** | **0.0136** | **0.0535** | **-0.0085** | **-0.0025** | **0.2065*** | **0.0849** | **0.1349** |
| | (0.907) | (0.757) | (0.859) | (0.681) | (0.949) | (0.989) | (0.077) | (0.315) | (0.384) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.1301** | | | **0.2768** | | | **0.0719** |
| | | | (0.185) | | | (0.287) | | | (0.794) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0622** | | | **0.3352**** | | | **0.2422*** |
| | | | (0.273) | | | (0.032) | | | (0.059) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0104** | | | **0.0237** | | | **-0.0408** |
| | | | (0.833) | | | (0.799) | | | (0.687) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.0044** | | | **-0.0126** | | | **-0.0241** |
| | | | (0.844) | | | (0.820) | | | (0.580) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0068** | | | **-0.0146** | | | **-0.0082** |
| | | | (0.248) | | | (0.146) | | | (0.252) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0216** | | | **0.0763*** | | | **0.0555** |
| | | | (0.193) | | | (0.074) | | | (0.188) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0009** | | | **-0.0036** | | | **-0.0215** |
| | | | (0.957) | | | (0.907) | | | (0.597) |
| $PPP_t$ | | **-0.0958** | **-0.1101** | | **0.2563** | **0.1825** | | **-0.1314** | **-0.1879** |
| | | (0.322) | (0.243) | | (0.358) | (0.492) | | (0.613) | (0.448) |
| $STK_t$ | | **-0.1098** | **-0.0982** | | **-0.2576*** | **-0.2268*** | | **-0.1931**** | **-0.1801*** |
| | | (0.175) | (0.250) | | (0.051) | (0.098) | | (0.038) | (0.055) |
| $R^2$ within | 0.0139 | 0.4811 | 0.4838 | 0.0193 | 0.0331 | 0.0387 | 0.0408 | 0.0710 | 0.0755 |
| F-statistic | 5.6639 | 31.1968 | 114.8126 | 3.0648 | 4.2388 | 63.5067 | 3.0532 | 3.4881 | 23.8236 |
| p-value | 0.0003 | 0.0000 | 0.0000 | 0.0131 | 0.0008 | 0.0000 | 0.0134 | 0.0031 | 0.0000 |
| Funds | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 |
| Observations | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 |

Table 3.8.G. Results for the UK equity funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **0.2031** | **0.1682** | **0.1412** | **0.0637** | **0.3556** | **0.4825** | **-0.0964** | **0.2157** | **0.4217** |
| | (0.446) | (0.180) | (0.262) | (0.754) | (0.445) | (0.324) | (0.667) | (0.607) | (0.340) |
| $f(age_{i,t})$ | **-0.0021** | **-0.0222** | **-0.0406** | **0.0600** | **0.0656** | **0.0240** | **0.1261**** | **0.1280** | **0.0950** |
| | (0.985) | (0.560) | (0.287) | (0.199) | (0.329) | (0.768) | (0.035) | (0.112) | (0.313) |
| $Bear_{i,t}$ | | **-0.7358***** | **-0.7443***** | | **0.1306*** | **0.0440** | | **0.1496** | **0.0387** |
| | | (0.000) | (0.000) | | (0.079) | (0.614) | | (0.278) | (0.814) |
| $Bull_{i,t}$ | | **-0.0257** | **-0.0195** | | **0.0278** | **-0.0214** | | **-0.1674** | **-0.2545** |
| | | (0.773) | (0.807) | | (0.785) | (0.897) | | (0.136) | (0.109) |
| $Size_{i,t-1}$ | **0.0028** | **-0.0051** | **0.0181** | **-0.0478***** | **-0.0480***** | **-0.0818*** | **-0.0124** | **-0.0269** | **-0.1075**** |
| | (0.938) | (0.685) | (0.495) | (0.000) | (0.005) | (0.063) | (0.475) | (0.227) | (0.044) |
| $Share_{i,t-1}$ | **0.0202***** | **0.0081*** | **0.0067** | **0.0130**** | **0.0150**** | **0.0159**** | **-0.0027** | **0.0048** | **0.0086** |
| | (0.003) | (0.072) | (0.142) | (0.045) | (0.032) | (0.040) | (0.699) | (0.490) | (0.254) |
| $ABIshare_{i,t-1}$ | **-0.0219** | **-0.0147**** | **-0.0137**** | **0.0069** | **0.0021** | **0.0037** | **0.0086** | **0.0060** | **0.0058** |
| | (0.107) | (0.018) | (0.025) | (0.505) | (0.823) | (0.696) | (0.327) | (0.357) | (0.405) |
| $p0\_5_{i,t}$ | **0.0475** | **0.0653** | **-0.0054** | **0.3823** | **0.2407** | **-0.2295** | **0.5622**** | **0.4078*** | **0.4341** |
| | (0.896) | (0.664) | (0.968) | (0.171) | (0.333) | (0.515) | (0.041) | (0.095) | (0.188) |
| $p5\_10_{i,t}$ | **-0.1462** | **0.0068** | **0.0273** | **-0.0582** | **-0.1467** | **-0.0680** | **0.2352** | **0.0556** | **0.5465** |
| | (0.630) | (0.952) | (0.875) | (0.770) | (0.362) | (0.817) | (0.241) | (0.767) | (0.124) |
| $p10\_15_{i,t}$ | **-0.1037** | **0.0070** | **-0.2220**** | **-0.0970** | **-0.1152** | **-0.5897***** | **0.0247** | **-0.0496** | **-0.4546**** |
| | (0.652) | (0.939) | (0.044) | (0.341) | (0.416) | (0.001) | (0.862) | (0.763) | (0.048) |
| $p15\_20_{i,t}$ | **-0.0732** | **0.0571** | **-0.0726** | **-0.0160** | **-0.0212** | **-0.0670** | **0.1180*** | **0.0357** | **0.0103** |
| | (0.588) | (0.323) | (0.293) | (0.798) | (0.716) | (0.566) | (0.077) | (0.579) | (0.929) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.0487** | | | **0.2914** | | | **-0.0167** |
| | | | (0.483) | | | (0.223) | | | (0.933) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **-0.0081** | | | **-0.0388** | | | **-0.2321** |
| | | | (0.895) | | | (0.793) | | | (0.175) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0941***** | | | **0.1986***** | | | **0.1869***** |
| | | | (0.000) | | | (0.002) | | | (0.007) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.0486**** | | | **0.0152** | | | **0.0138** |
| | | | (0.029) | | | (0.768) | | | (0.798) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0051** | | | **0.0100** | | | **0.0217**** |
| | | | (0.253) | | | (0.250) | | | (0.026) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0036** | | | **0.0367** | | | **0.0445** |
| | | | (0.854) | | | (0.169) | | | (0.136) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0028** | | | **0.0203** | | | **0.0344** |
| | | | (0.905) | | | (0.596) | | | (0.247) |
| $PPP_t$ | | **0.0922** | **0.1020** | | **-0.3200** | **-0.3215** | | **-0.2313** | **-0.2334** |
| | | (0.348) | (0.314) | | (0.410) | (0.402) | | (0.524) | (0.516) |
| $STK_t$ | | **0.2228**** | **0.2387**** | | **0.0211** | **0.0111** | | **0.0020** | **-0.0335** |
| | | (0.023) | (0.014) | | (0.913) | (0.958) | | (0.992) | (0.865) |
| $R^2$ within | 0.0216 | 0.6380 | 0.6404 | 0.0113 | 0.0183 | 0.0215 | 0.0104 | 0.0468 | 0.0531 |
| F-statistic | 3.2499 | 57.6860 | 215.2913 | 12.3043 | 24.9774 | 32.5343 | 3.2070 | 15.0936 | 37.9816 |
| p-value | 0.0096 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0103 | 0.0000 | 0.0000 |
| Funds | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 |
| Observations | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 |

Table 3.9.A. Results for the all-funds, allocation, fixed income, and equity samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$, under the restriction that fund's age is up to 5 years. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | All-Funds | | | Allocation | | | Fixed Income | | | Equity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.3844**** | **-0.4065** | **0.0027** | **-1.0344***** | **-2.1569***** | **-1.3880**** | **-0.5373***** | **-0.2734** | **-0.5995** | **-0.2198** | **-0.2456** | **0.1925** |
| | (0.015) | (0.108) | (0.991) | (0.004) | (0.002) | (0.011) | (0.009) | (0.616) | (0.247) | (0.114) | (0.369) | (0.548) |
| $f(age_{i,t})$ | **0.2908**** | **0.1540**** | **0.1835*** | **0.4806***** | **0.8927***** | **0.5869*** | **0.1743** | **-0.2567*** | **-0.1298** | **0.2628***** | **0.1364** | **0.1861** |
| | (0.012) | (0.025) | (0.062) | (0.007) | (0.002) | (0.074) | (0.296) | (0.058) | (0.356) | (0.008) | (0.196) | (0.182) |
| $Bear_{i,t}$ | **-0.3361**** | **-0.2587*** | **-0.3106** | **-0.2546** | **0.7648*** | **-0.2650** | **-0.5636***** | **-0.9544**** | **-0.3509** | **-0.3800***** | **-0.2696** | **-0.2835** |
| | (0.010) | (0.051) | (0.177) | (0.187) | (0.088) | (0.544) | (0.005) | (0.024) | (0.246) | (0.005) | (0.102) | (0.325) |
| $Bull_{i,t}$ | **0.7277***** | **0.6718**** | **0.3177** | **1.0358***** | **1.9727***** | **0.9224*** | **0.8268***** | **0.6430** | **0.3917** | **0.5576***** | **0.5082**** | **0.1004** |
| | (0.000) | (0.019) | (0.233) | (0.003) | (0.001) | (0.052) | (0.000) | (0.186) | (0.285) | (0.001) | (0.040) | (0.716) |
| $Size_{i,t-1}$ | **0.0421**** | **0.1200**** | **0.0633** | **0.1604***** | **0.3886***** | **-0.0628** | **0.0624** | **0.2031**** | **0.2356***** | **0.0109** | **0.0383** | **0.0216** |
| | (0.025) | (0.015) | (0.221) | (0.001) | (0.000) | (0.644) | (0.353) | (0.029) | (0.002) | (0.566) | (0.608) | (0.731) |
| $Share_{i,t-1}$ | **0.0049** | **0.0098*** | **0.0033** | **-0.0331** | **-0.0520** | **0.0238** | **0.0060** | **-0.0011** | **-0.0050** | **0.0103*** | **0.0264**** | **0.0085** |
| | (0.143) | (0.060) | (0.526) | (0.244) | (0.114) | (0.318) | (0.112) | (0.914) | (0.564) | (0.099) | (0.012) | (0.372) |
| $ABIshare_{i,t-1}$ | **-0.0081**** | **0.0249*** | **0.0253*** | **0.0340** | **0.0248** | **0.0025** | **-0.0218** | **0.0083** | **0.0331** | **-0.0119*** | **0.0261*** | **0.0262*** |
| | (0.043) | (0.094) | (0.073) | (0.160) | (0.274) | (0.902) | (0.254) | (0.849) | (0.295) | (0.061) | (0.091) | (0.095) |
| $p0\_5_{i,t}$ | **-0.1362** | **-0.4133** | **-0.0400** | **0.5231** | **1.0062** | **1.2051** | **-0.2386** | **-1.9279** | **-1.2028** | **-0.0933** | **-0.4071** | **0.1603** |
| | (0.513) | (0.348) | (0.928) | (0.315) | (0.361) | (0.190) | (0.503) | (0.140) | (0.217) | (0.670) | (0.288) | (0.700) |
| $p5\_10_{i,t}$ | **-0.0023** | **-0.9922***** | **-0.6131*** | **-0.0968** | **-1.4120*** | **0.0803** | **0.5009*** | **-0.0464** | **-0.9716** | **-0.0363** | **-1.1272***** | **-0.5901** |
| | (0.988) | (0.005) | (0.064) | (0.757) | (0.055) | (0.905) | (0.067) | (0.966) | (0.149) | (0.831) | (0.001) | (0.101) |
| $p10\_15_{i,t}$ | **-0.1198** | **-0.4294**** | **-0.3371** | **-0.1971** | **0.5702** | **0.8669** | **0.2135** | **-0.1643** | **0.1054** | **-0.1502** | **-0.6351***** | **-0.5491*** |
| | (0.243) | (0.016) | (0.147) | (0.326) | (0.360) | (0.133) | (0.123) | (0.610) | (0.664) | (0.127) | (0.008) | (0.056) |
| $p15\_20_{i,t}$ | **0.1526**** | **-0.3514**** | **-0.0161** | **0.5659***** | **0.9373***** | **1.4802***** | **0.0915** | **-0.1884** | **-0.0109** | **0.0824** | **-0.5454***** | **-0.1511** |
| | (0.050) | (0.020) | (0.924) | (0.005) | (0.007) | (0.000) | (0.613) | (0.296) | (0.948) | (0.199) | (0.006) | (0.406) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.0758** | **0.2788** | **0.0519** | **-0.2827** | **-1.1260***** | **-0.8744***** | **0.1245** | **0.2965** | **0.0989** | **0.0443** | **0.4019** | **0.0663** |
| | (0.339) | (0.309) | (0.805) | (0.294) | (0.000) | (0.003) | (0.337) | (0.429) | (0.693) | (0.579) | (0.180) | (0.790) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0311** | **0.5381***** | **0.4256**** | **0.1344** | **0.1601** | **-0.0425** | **-0.1397** | **-0.5243** | **0.1535** | **0.0268** | **0.6666***** | **0.4635**** |
| | (0.655) | (0.007) | (0.015) | (0.304) | (0.650) | (0.917) | (0.397) | (0.477) | (0.663) | (0.693) | (0.001) | (0.020) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0376** | **0.1451** | **0.1101** | **-0.0115** | **-0.7502**** | **-0.5462** | **-0.0228** | **-0.0460** | **-0.2467** | **0.0505** | **0.2560*** | **0.2316** |
| | (0.700) | (0.179) | (0.508) | (0.918) | (0.044) | (0.203) | (0.839) | (0.832) | (0.304) | (0.620) | (0.067) | (0.239) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.1101**** | **0.2197**** | **0.0037** | **-0.2716**** | **-0.3205** | **-0.6046*** | **-0.0175** | **0.0601** | **-0.0761** | **-0.0774*** | **0.3221***** | **0.0856** |
| | (0.017) | (0.021) | (0.973) | (0.040) | (0.229) | (0.068) | (0.876) | (0.649) | (0.482) | (0.065) | (0.007) | (0.424) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0017** | **-0.0156** | **-0.0063** | **-0.0339***** | **-0.0862**** | **0.0418** | **0.0126** | **0.0061** | **-0.0425** | **-0.0008** | **-0.0018** | **-0.0038** |
| | (0.878) | (0.593) | (0.841) | (0.009) | (0.037) | (0.527) | (0.696) | (0.868) | (0.178) | (0.920) | (0.957) | (0.891) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **-0.1193** | **0.2157***** | **0.1744** | **-0.2093**** | **-0.1296** | **0.1753** | **0.1809** | **0.6830**** | **0.4174**** | **-0.1368*** | **0.1564*** | **0.0971** |
| | (0.134) | (0.003) | (0.132) | (0.020) | (0.551) | (0.417) | (0.190) | (0.023) | (0.043) | (0.058) | (0.060) | (0.502) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.4062***** | **-0.3679***** | **-0.2879**** | **-0.6663***** | **-0.9835***** | **-0.6856**** | **-0.4264**** | **-0.3366** | **-0.2211** | **-0.3263***** | **-0.3087**** | **-0.2048** |
| | (0.001) | (0.006) | (0.033) | (0.007) | (0.001) | (0.014) | (0.018) | (0.181) | (0.271) | (0.004) | (0.012) | (0.168) |
| $PPP_t$ | **-0.0736** | **-0.0350** | **-0.2021**** | **0.0709** | **0.5087** | **0.8582***** | **-0.0614** | **0.0811** | **0.3959** | **-0.0654** | **-0.0853** | **-0.3308***** |
| | (0.207) | (0.808) | (0.032) | (0.700) | (0.192) | (0.003) | (0.419) | (0.755) | (0.156) | (0.322) | (0.550) | (0.004) |
| $STK_t$ | **0.0280** | **-0.3212***** | **-0.2060**** | **-0.0257** | **-0.7572***** | **-0.1724** | **0.0050** | **0.0296** | **-0.0382** | **0.0861** | **-0.2757***** | **-0.1401** |
| | (0.728) | (0.000) | (0.027) | (0.858) | (0.001) | (0.368) | (0.965) | (0.810) | (0.679) | (0.323) | (0.000) | (0.123) |
| $R^2$ within | 0.4898 | 0.0335 | 0.0355 | 0.5327 | 0.1557 | 0.1160 | 0.1951 | 0.0485 | 0.0520 | 0.5958 | 0.0405 | 0.0453 |
| F-statistic | 58.5422 | 43.5167 | 22.3748 | 589.7869 | 201.0065 | 317.8551 | 20.4455 | 32.8374 | 22.3242 | 413.6079 | 46.8557 | 22.1454 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 4708 | 4708 | 4708 | 294 | 294 | 294 | 665 | 665 | 665 | 3468 | 3468 | 3468 |
| Observations | 15372 | 15372 | 15372 | 950 | 950 | 950 | 2143 | 2143 | 2143 | 11512 | 11512 | 11512 |

Table 3.9.B. Results for the equity sub-samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$, under the restriction that fund's age is up to 5 years. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sub-sample | | Emerging | | | International | | | UK | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.0703** | **-1.4040*** ** | **-1.4655*** ** | **-0.2872*** | **-0.1914** | **0.6098** ** | **-0.2193** | **0.2393** | **0.2055** |
| | (0.781) | (0.000) | (0.000) | (0.084) | (0.556) | (0.015) | (0.197) | (0.644) | (0.631) |
| $f(age_{i,t})$ | **0.0693** | **0.9062*** ** | **1.0419** ** | **0.2636*** ** | **0.1638** | **0.2369** | **0.2529*** | **0.1478** | **0.1636** |
| | (0.782) | (0.004) | (0.011) | (0.002) | (0.285) | (0.129) | (0.097) | (0.495) | (0.422) |
| $Bear_{i,t}$ | **-0.9585*** ** | **-0.5270*** | **-0.6224** | **-0.2366** ** | **-0.2353** | **-0.3200*** | **-0.5262*** ** | **-0.0662** | **0.0026** |
| | (0.000) | (0.097) | (0.129) | (0.043) | (0.138) | (0.068) | (0.006) | (0.715) | (0.995) |
| $Bull_{i,t}$ | **0.2176** | **2.2399*** ** | **1.5450*** ** | **0.5176*** ** | **0.8510*** ** | **0.4086*** | **0.6037** ** | **0.0197** | **-0.3704** |
| | (0.475) | (0.000) | (0.008) | (0.000) | (0.002) | (0.062) | (0.037) | (0.959) | (0.344) |
| $Size_{i,t-1}$ | **-0.1168** ** | **0.0302** | **0.2668*** ** | **0.0524** | **0.0270** | **0.0204** | **-0.0261** | **-0.0027** | **-0.0809** |
| | (0.048) | (0.734) | (0.002) | (0.116) | (0.821) | (0.805) | (0.395) | (0.963) | (0.288) |
| $Share_{i,t-1}$ | **0.0040** | **0.0166*** | **-0.0028** | **-0.0026** | **0.0340** | **0.0100** | **0.0190*** | **0.0380*** ** | **0.0249** ** |
| | (0.485) | (0.050) | (0.783) | (0.783) | (0.273) | (0.695) | (0.079) | (0.005) | (0.028) |
| $ABIshare_{i,t-1}$ | **0.0764*** ** | **-0.0028** | **0.0065** | **-0.0066** | **0.0054** | **-0.0047** | **-0.0140** | **0.0221** | **0.0225** |
| | (0.002) | (0.935) | (0.880) | (0.273) | (0.838) | (0.846) | (0.111) | (0.335) | (0.194) |
| $p0\_5_{i,t}$ | **0.0538** | **0.7378** | **0.8126** | **0.0252** | **-1.0483** ** | **-0.4877** | **-0.3065** | **0.1168** | **0.8524*** |
| | (0.889) | (0.377) | (0.247) | (0.931) | (0.048) | (0.343) | (0.148) | (0.847) | (0.091) |
| $p5\_10_{i,t}$ | **-1.1890** | **-1.0641** | **-1.3788** | **-0.0979** | **-2.0276*** ** | **-1.6305*** ** | **0.0380** | **-0.1839** | **0.5904** |
| | (0.173) | (0.276) | (0.304) | (0.611) | (0.001) | (0.001) | (0.832) | (0.663) | (0.134) |
| $p10\_15_{i,t}$ | **0.7909** ** | **-1.3221** | **-0.4600** | **-0.1270** | **-0.7352** ** | **-0.6511** ** | **-0.2071** ** | **-0.5623** ** | **-0.5313** |
| | (0.023) | (0.195) | (0.565) | (0.328) | (0.034) | (0.041) | (0.026) | (0.039) | (0.122) |
| $p15\_20_{i,t}$ | **-0.9948*** | **0.1711** | **-1.5875** ** | **0.1692*** | **-0.7295** ** | **-0.3653** | **0.0438** | **-0.4790** | **-0.0643** |
| | (0.072) | (0.849) | (0.030) | (0.065) | (0.018) | (0.115) | (0.602) | (0.107) | (0.828) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.4300** ** | **-0.5983*** | **-0.3026** | **0.0775** | **0.4054** | **0.1272** | **-0.0096** | **0.3699** | **-0.0020** |
| | (0.020) | (0.085) | (0.266) | (0.428) | (0.204) | (0.697) | (0.939) | (0.391) | (0.995) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **1.0126** ** | **0.9190** | **1.3168** | **0.1402** | **1.1358*** ** | **0.9755*** ** | **-0.1708** | **0.0639** | **-0.1307** |
| | (0.035) | (0.102) | (0.114) | (0.162) | (0.001) | (0.001) | (0.146) | (0.842) | (0.652) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.3625*** | **0.5432** | **0.0320** | **0.0785** | **0.2477** | **0.2306** | **0.0174** | **0.2631** | **0.3164** |
| | (0.056) | (0.307) | (0.951) | (0.503) | (0.193) | (0.271) | (0.851) | (0.188) | (0.185) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **0.6118*** | **-0.4887** | **0.7834*** | **-0.1183** ** | **0.4444** ** | **0.2153** | **-0.0720** | **0.2395** | **-0.0009** |
| | (0.075) | (0.428) | (0.075) | (0.023) | (0.023) | (0.122) | (0.217) | (0.123) | (0.996) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0522** ** | **0.0355** | **-0.0386** | **-0.0127** | **0.0236** | **0.0121** | **0.0084** | **-0.0260** | **-0.0050** |
| | (0.020) | (0.418) | (0.398) | (0.239) | (0.634) | (0.730) | (0.306) | (0.394) | (0.874) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.1016** | **0.5978*** ** | **0.3567** | **-0.1418** ** | **0.0304** | **-0.0130** | **-0.1252** | **0.1272** | **0.0541** |
| | (0.531) | (0.006) | (0.160) | (0.037) | (0.690) | (0.901) | (0.269) | (0.186) | (0.790) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0552** | **-0.9317*** ** | **-0.8273** ** | **-0.2472*** ** | **-0.5127*** ** | **-0.3970*** ** | **-0.4142** ** | **-0.0628** | **0.0423** |
| | (0.769) | (0.003) | (0.044) | (0.001) | (0.001) | (0.004) | (0.038) | (0.749) | (0.837) |
| $PPP_t$ | | | | **-0.0591** | **-0.0754** | **-0.5510*** ** | **-0.0197** | **-0.3401*** | **-0.0848** |
| | | | | (0.450) | (0.679) | (0.001) | (0.787) | (0.060) | (0.643) |
| $STK_t$ | **0.1986** | **-0.9353*** ** | **-0.8918** ** | **-0.0306** | **-0.2848** | **-0.1958** | **0.2634** ** | **-0.3181** | **-0.1422** |
| | (0.320) | (0.000) | (0.018) | (0.764) | (0.228) | (0.129) | (0.023) | (0.140) | (0.426) |
| $R^2$ within | 0.8780 | 0.2434 | 0.3898 | 0.5486 | 0.0854 | 0.0969 | 0.6590 | 0.0364 | 0.0628 |
| F-statistic | 2243.4547 | 85461.2614 | 17012.6442 | 181.7728 | 24.9647 | 44.2745 | 1031.3192 | 110.4798 | 74.6793 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 179 | 179 | 179 | 1827 | 1827 | 1827 | 1462 | 1462 | 1462 |
| Observations | 490 | 490 | 490 | 6041 | 6041 | 6041 | 4981 | 4981 | 4981 |

Indeed, giving individual funds a similar representation in the sample, i.e., taking into account only the first five years of funds' life gives a better insight into the story. To continue on the point made in the previous paragraph, the observed decline in the slope of the interactive term of fund's age and provider's age is still present, so it cannot be fully attributed to an uneven number of observations used in regressions. Moreover, the underperformance of the 'middle-age' providers is also preserved, although the superior performance of the youngest providers disappears. This may be the effect of the exclusion of older years of funds that have been in operation for more than five years. Obviously, these funds will be operated by older providers. If these old funds of old providers do not perform well in comparison with young funds, excluding them improves the performance figures of old providers and reduces a performance gap between them and young providers.

There is also evidence that bear market underperformance (outperformance for the allocation funds) is preserved, and as previously fund's age reduced it. A slightly different result is obtained for bull markets. This time outperformance is observed for all investment styles, and older funds outperform less (the interactive term has a negative coefficient). The interaction of the bear dummy with fund's age is very similar to that of the unrestricted samples. However, the interaction with the bull market dummy becomes significant and negative for all investment types. The restriction reveals that very young funds gain much more in bullish climate, suggesting that managers of these young funds try harder to make use of the positive conditions.

It is also interesting that the impact of provider's size and its interaction with fund's age on performance slightly changes when only young funds are used in the regressions. The strong impact of size as presented in Tables 3.8 is not so uniform now. For example, the international equity funds and the UK equity funds have hardly any significant coefficients, and the emerging equity funds have negative coefficients estimated for the Sharpe ratios. The coefficients estimated for the interaction term of size and fund's age are mostly insignificant with an exception of the allocation funds (negative) and the emerging equity funds (positive). This seems to suggest that the positive impact of size becomes less important as a fund gets older for the allocation funds, but more important for the emerging equity funds. In the case of the other investment styles, it does not matter.

The results for the provider’s market share and the ABI’s share within the provider are similar to those of the unrestricted samples. This is also the case for the regulatory change dummies although their effect is more pronounced under the restriction. The performance of young allocation funds increased after the introduction of personal plans and decreased with that of the stakeholder schemes. The introduction of personal plans also decreased the performance of both international and UK equity funds. This may well be an indication that the focus shifted from funds investing in ‘single’ asset types to those that had a more diversified portfolio. The introduction of stakeholder schemes has again a positive effect on the Sharpe ratio of UK equity funds but this time it is the performance of emerging equity funds that is strongly negatively affected. This is also consistent with the hypothesis that there would be less attention on expensive investment styles once management fees got an upper limit.

The biggest difference in the results, however, is in the significance of the constant and of fund’s age. This time the majority of the estimates of the constant terms are negative and statistically significant. The exceptions are the international equity funds for which several positive coefficients are obtained, as well as the equity funds and the UK equity funds where there is practically no significance at all. Contrary to the previous results, the coefficients estimated for the age functions are statistically significant for every investment style. They are positive for the allocation and the equity funds (and all three equity subsamples, i.e. emerging, international, UK) but they remain negative for the fixed income funds. This shows that although a learning period may well apply to young allocation and equity funds, fixed income funds start with high performance.

On a final note, the average performance of the funds as indicated by the constant coefficient in specification (1) does not change much under the restriction. The results for this set of regressions are shown in Appendix G. The constant for the Sharpe ratio is once more insignificant for all samples (except emerging equity funds) whereas it is significantly positive for performance relative to the PPB. The only notable change is that the difference-in-returns for emerging equity funds becomes insignificant under the restriction.

The other issue that may affect the reliability of these results relates to the discussion of Figure 2.6 in Chapter 2. This Figure shows that approximately two-thirds of all funds available at the end of 2009 opened after 2000. This is reflected in the observed sample with 61% of all return observations belonging to funds with inception date from 2000 and later. In comparison, only 14.6% of observations are from funds that opened in the 1990s, 22% in the 1980s, and just 2% in the 1970s. This disproportionality may create a bias in the assessment of performance, and more importantly, in its relationship with fund’s age since the performance of young funds may have been affected by events taking place in the early 2000s and not by fund’s age per se.

Ideally, this potential bias could be controlled for by including in the specification dummy variables that represent the inception year of each fund. These dummies would then capture any ‘foundation year’ effects. However, Section 3.3.2 has demonstrated that there are strong fund effects in the panel calling for unit fixed effects estimation in order to get unbiased coefficients. Consequently, it is technically impossible to add time-invariant factors such as foundation year dummies. In order to sidestep this problem, the all-funds sample is divided into sub-samples according to the inception decade of each fund and the regression analysis is repeated for each decade. Tables 3.10.A-C show the results of specifications (3) and (4) for the all-funds sample with the square root age function sorted by inception decade. The corresponding results with the linear, logarithmic, and cubic root functions are shown in Appendix I. Note that the regulatory dummies are excluded from these regressions since for funds that opened in the 1990s and 2000s there are no observations for the PPP introduction. This should not be an important omission since both dummies were insignificant in all previous regressions for the all-funds sample.

The first obvious difference between the decades is the number of funds and available observations for each decade. Funds that opened in the 2000s dominate in the all-funds sample. This can be seen, for example, in the effect of provider’s size on performance which appears to have a significantly positive effect for all performance measures in the all-funds sample but is significant only for the 2000s sample for the Sharpe ratio and the 2000s and 1980s samples for the difference-in-returns and the M2. Furthermore, the difference-in-returns underperformance of middle-aged providers (who then catch-up as their funds get older) is ‘caused’ by funds that opened in the 2000s and the 1990s.

In terms of the relationship between performance and fund’s age, one sees that the catching-up pattern appears in the Sharpe ratio for funds that opened in the 1990s and 2000s. However, the Sharpe ratio of funds that opened in the 1970s actually declines with fund’s age so that the ‘average’ effect in the all-funds sample is insignificant. The coefficients of fund’s age are insignificant for the difference-in-returns for all foundation decades but the catching-up pattern shows again for the 1990s and 1980s in the M2 regressions.

Nevertheless, there is some consistency across decades with the results of the previous analysis. For example, market conditions seem to affect the Sharpe ratio more than they do the performance relative to the benchmark. Moreover, the losses during bear years are not fully made up for in years with bull markets. The provider’s market share still has no effect whereas the ABI’s share covaries positively with the difference-in-returns.

Generally, there are some differences depending on which decade funds have been incepted in. Some form of catching-up appears in all decades except the 1970 and the results particularly for market conditions are consistent with those previously presented. It is clear that funds that opened in the 2000s ‘cause’ the overall results since they account for more than half of the observations. As such, there is the possibility of some foundation year effects but any potential bias caused by this is probably small since the results do not vary greatly between decades.

Table 3.10.A. Results for the all-funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | | | | Sharpe | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | 0.0048 | 0.1379 | -0.0751 | -0.1201 | 0.5253** | -0.0419 | -0.1332 | -0.2349 | -0.0447 | 0.7177** |
| | (0.956) | (0.150) | (0.454) | (0.281) | (0.041) | (0.696) | (0.326) | (0.104) | (0.800) | (0.028) |
| $f(age_{i,t})$ | 0.0156 | -0.0264 | 0.0433 | 0.0154 | -0.1049** | 0.0151 | 0.0946* | 0.1151** | 0.0071 | -0.1453* |
| | (0.653) | (0.638) | (0.200) | (0.582) | (0.035) | (0.707) | (0.062) | (0.023) | (0.888) | (0.075) |
| $Bear_{i,t}$ | -0.5344*** | -0.5897*** | -0.4468*** | -0.4327*** | -0.3513*** | -0.5778*** | -0.4720*** | -0.1753 | -0.4361** | -0.6050** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.003) | (0.300) | (0.011) | (0.016) |
| $Bull_{i,t}$ | 0.0628 | 0.0106 | 0.1371 | 0.1430** | 0.2106** | 0.1143 | 0.3030** | 0.5443*** | 0.4250** | 0.6099* |
| | (0.391) | (0.888) | (0.102) | (0.038) | (0.034) | (0.104) | (0.049) | (0.000) | (0.032) | (0.088) |
| $Size_{i,t-1}$ | 0.0161 | 0.0334** | -0.0037 | 0.0009 | 0.0523 | 0.0563** | 0.0779** | -0.0763 | -0.1246 | -0.2710 |
| | (0.235) | (0.022) | (0.824) | (0.955) | (0.129) | (0.024) | (0.023) | (0.134) | (0.201) | (0.262) |
| $Share_{i,t-1}$ | 0.0010 | 0.0007 | 0.0008 | 0.0012 | 0.0007 | -0.0004 | -0.0033 | 0.0024 | 0.0024 | -0.0005 |
| | (0.630) | (0.890) | (0.732) | (0.475) | (0.844) | (0.842) | (0.610) | (0.114) | (0.126) | (0.925) |
| $ABIshare_{i,t-1}$ | 0.0011 | -0.0044 | -0.0006 | 0.0058 | -0.0167 | 0.0005 | -0.0013 | -0.0005 | 0.0059 | -0.0089 |
| | (0.703) | (0.441) | (0.774) | (0.245) | (0.183) | (0.865) | (0.820) | (0.797) | (0.220) | (0.477) |
| $p0\_5_{i,t}$ | 0.0888 | -0.2796 | 0.2324* | 0.0771 | -0.1297 | -0.1378 | -0.5253** | 0.7003 | -0.0901 | -0.8006** |
| | (0.434) | (0.155) | (0.063) | (0.419) | (0.542) | (0.386) | (0.038) | (0.300) | (0.701) | (0.032) |
| $p5\_10_{i,t}$ | 0.0928 | -0.1662 | 0.1079* | 0.0630 | -0.0898 | 0.0337 | -0.3951** | 0.0427 | -0.1462 | -0.4251 |
| | (0.306) | (0.299) | (0.063) | (0.474) | (0.545) | (0.821) | (0.030) | (0.752) | (0.530) | (0.464) |
| $p10\_15_{i,t}$ | 0.0762 | -0.1934** | 0.1076 | 0.0775 | -0.1214 | -0.0350 | -0.1011 | 0.0036 | -0.1482 | -0.2809 |
| | (0.282) | (0.013) | (0.164) | (0.209) | (0.250) | (0.778) | (0.167) | (0.982) | (0.442) | (0.570) |
| $p15\_20_{i,t}$ | 0.0709 | -0.0212 | 0.0371 | 0.0417 | 0.0796 | 0.0133 | 0.1600 | -0.0323 | -0.0569 | -0.5989* |
| | (0.199) | (0.670) | (0.432) | (0.258) | (0.335) | (0.869) | (0.259) | (0.666) | (0.712) | (0.055) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | | | | 0.1354* | 0.2164*** | -0.2522 | 0.0525 | 0.2755** |
| | | | | | | (0.062) | (0.004) | (0.498) | (0.578) | (0.014) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | | | | 0.0223 | 0.1239 | 0.0528 | 0.0638 | 0.0878 |
| | | | | | | (0.634) | (0.208) | (0.302) | (0.455) | (0.580) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | | | | 0.0352 | -0.0677 | 0.0640 | 0.0694 | 0.0402 |
| | | | | | | (0.197) | (0.323) | (0.213) | (0.220) | (0.747) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | | | | 0.0148 | -0.1107 | 0.0335 | 0.0230 | 0.1681** |
| | | | | | | (0.389) | (0.238) | (0.228) | (0.574) | (0.013) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | | | | -0.0101** | -0.0179** | 0.0178 | 0.0261 | 0.0574 |
| | | | | | | (0.026) | (0.017) | (0.160) | (0.226) | (0.183) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | | | | 0.0222 | -0.0592 | -0.1036** | 0.0006 | 0.0519 |
| | | | | | | (0.270) | (0.191) | (0.038) | (0.991) | (0.388) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | | | | -0.0185 | -0.1627** | -0.1520*** | -0.0779 | -0.0839 |
| | | | | | | (0.328) | (0.015) | (0.002) | (0.149) | (0.311) |
| $R^2$ within | 0.3960 | 0.4696 | 0.3753 | 0.2910 | 0.3534 | 0.4002 | 0.4794 | 0.4077 | 0.3067 | 0.3863 |
| F-statistic | 28.4575 | 26580.9908 | 21.9536 | 30.1507 | 9.9844 | 59.1972 | 1327.6346 | 348.5479 | 23.6920 | 17.7095 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table 3.10.B. Results for the all-funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | $R_{Fund}$-$R_{PPB}$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | -0.0816 | -0.0959 | 0.0503 | -0.1407 | 0.2320 | -0.1523 | -0.2143 | 0.0904 | -0.4194 | 0.0820 |
| | (0.580) | (0.664) | (0.798) | (0.638) | (0.740) | (0.422) | (0.246) | (0.737) | (0.283) | (0.921) |
| $f(age_{i,t})$ | -0.0035 | -0.0383 | 0.0314 | -0.0121 | -0.1157 | -0.0189 | -0.0484 | 0.0217 | 0.0606 | -0.1194 |
| | (0.913) | (0.418) | (0.434) | (0.819) | (0.398) | (0.645) | (0.604) | (0.756) | (0.407) | (0.386) |
| $Bear_{i,t}$ | 0.0354 | 0.0045 | 0.1441 | 0.1286 | -0.0814 | -0.0453 | -0.3014*** | 0.1535 | 0.6000*** | -2.3753** |
| | (0.425) | (0.936) | (0.175) | (0.192) | (0.717) | (0.461) | (0.005) | (0.603) | (0.007) | (0.042) |
| $Bull_{i,t}$ | 0.0445 | 0.0668 | 0.0631 | 0.0838 | 0.1269 | 0.1065 | 0.0071 | 0.3298 | 0.4674 | 1.4429 |
| | (0.475) | (0.563) | (0.476) | (0.266) | (0.253) | (0.284) | (0.923) | (0.176) | (0.154) | (0.220) |
| $Size_{i,t-1}$ | 0.0210 | 0.0542* | -0.0244 | 0.0098 | 0.0470 | 0.1196** | 0.1778*** | -0.1645* | 0.1525* | 0.0687 |
| | (0.272) | (0.100) | (0.269) | (0.619) | (0.131) | (0.010) | (0.001) | (0.059) | (0.060) | (0.905) |
| $Share_{i,t-1}$ | 0.0068** | 0.0066* | 0.0062 | 0.0049 | 0.0070 | 0.0032 | -0.0062 | 0.0086** | 0.0044 | -0.0034 |
| | (0.025) | (0.051) | (0.138) | (0.322) | (0.614) | (0.275) | (0.141) | (0.042) | (0.374) | (0.871) |
| $ABIshare_{i,t-1}$ | 0.0141*** | 0.0065 | 0.0046 | 0.0273** | 0.0333** | 0.0120*** | 0.0108* | 0.0041 | 0.0278*** | 0.0603** |
| | (0.002) | (0.204) | (0.233) | (0.014) | (0.033) | (0.004) | (0.073) | (0.301) | (0.009) | (0.043) |
| $p0\_5_{i,t}$ | 0.1159 | -0.3574 | -0.1374 | 0.2512 | 0.1642 | -0.3668 | -0.7430 | 2.0137 | 0.0102 | 0.3436 |
| | (0.550) | (0.168) | (0.600) | (0.262) | (0.690) | (0.414) | (0.172) | (0.118) | (0.990) | (0.725) |
| $p5\_10_{i,t}$ | -0.1479 | -0.2305 | -0.3220** | -0.2370 | -0.2299 | -0.6299** | -1.0503** | -0.1679 | -0.8511 | 1.6845 |
| | (0.386) | (0.167) | (0.043) | (0.199) | (0.637) | (0.043) | (0.047) | (0.714) | (0.206) | (0.344) |
| $p10\_15_{i,t}$ | 0.0057 | -0.1536 | -0.1951 | -0.0074 | 0.1626 | -0.3764** | -0.1671 | -0.8158** | -0.1615 | 0.4652 |
| | (0.947) | (0.155) | (0.222) | (0.945) | (0.509) | (0.041) | (0.468) | (0.012) | (0.582) | (0.630) |
| $p15\_20_{i,t}$ | 0.0406 | -0.0118 | -0.0663 | 0.0026 | 0.0617 | -0.0568 | 0.2044 | -0.5076** | -0.0094 | -0.8349 |
| | (0.570) | (0.869) | (0.477) | (0.970) | (0.533) | (0.621) | (0.466) | (0.026) | (0.969) | (0.562) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | | | | 0.2989 | 0.3762* | -0.9928 | 0.1959 | -0.0124 |
| | | | | | | (0.139) | (0.078) | (0.152) | (0.603) | (0.974) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | | | | 0.2217** | 0.4350* | 0.1241 | 0.3117 | -0.7220 |
| | | | | | | (0.015) | (0.078) | (0.518) | (0.203) | (0.199) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | | | | 0.1247*** | -0.0954 | 0.3790*** | 0.0489 | -0.0807 |
| | | | | | | (0.009) | (0.399) | (0.006) | (0.544) | (0.752) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | | | | 0.0165 | -0.1448 | 0.2254** | -0.0081 | 0.2297 |
| | | | | | | (0.535) | (0.424) | (0.013) | (0.891) | (0.501) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | | | | -0.0248*** | -0.0426*** | 0.0367* | -0.0300* | -0.0061 |
| | | | | | | (0.006) | (0.009) | (0.057) | (0.080) | (0.951) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | | | | 0.0423* | 0.1780*** | -0.0067 | -0.1335*** | 0.4863** |
| | | | | | | (0.069) | (0.002) | (0.933) | (0.009) | (0.026) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | | | | -0.0207 | 0.0239 | -0.0984 | -0.1106 | -0.2743 |
| | | | | | | (0.382) | (0.752) | (0.168) | (0.172) | (0.238) |
| $R^2$ within | 0.0052 | 0.0072 | 0.0127 | 0.0158 | 0.0512 | 0.0102 | 0.0146 | 0.0275 | 0.0263 | 0.1903 |
| F-statistic | 1.8930 | 168.1659 | 2.8184 | 1.5682 | 5.9053 | 68.9558 | 1964.9857 | 460.8846 | 4.2824 | 58.3724 |
| p-value | 0.0894 | 0.0000 | 0.0250 | 0.1680 | 0.0001 | 0.0000 | 0.0000 | 0.0000 | 0.0003 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table 3.10.C. Results for the all-funds sample with $f(age_{i,t}) = \sqrt{age_{i,t}}$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | | | | M2 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **-0.0405** | **0.0352** | **-0.1603** | **-0.1312** | **0.0877** | **-0.0721** | **0.0927** | **-0.1893** | **-0.5818*** | **0.2534** |
| | (0.835) | (0.899) | (0.402) | (0.577) | (0.892) | (0.773) | (0.735) | (0.460) | (0.067) | (0.712) |
| $f(age_{i,t})$ | **0.0319** | **-0.0229** | **0.1133**** | **0.0049** | **-0.0367** | **0.0175** | **-0.0562** | **0.1265*** | **0.1204**** | **-0.1092** |
| | (0.378) | (0.778) | (0.027) | (0.891) | (0.750) | (0.699) | (0.636) | (0.080) | (0.043) | (0.344) |
| $Bear_{i,t}$ | **-0.0551** | **-0.1001** | **-0.0021** | **0.0528** | **0.1710** | **-0.1416** | **-0.4108**** | **0.0709** | **0.5992**** | **-0.4894** |
| | (0.330) | (0.243) | (0.984) | (0.529) | (0.142) | (0.131) | (0.039) | (0.784) | (0.012) | (0.172) |
| $Bull_{i,t}$ | **-0.1558**** | **-0.1678** | **-0.1335** | **-0.0831** | **0.0342** | **-0.1403** | **-0.1539** | **0.1113** | **0.2934** | **0.7859** |
| | (0.015) | (0.117) | (0.161) | (0.243) | (0.670) | (0.150) | (0.326) | (0.626) | (0.169) | (0.164) |
| $Size_{i,t-1}$ | **0.0325** | **0.0631*** | **-0.0111** | **0.0212** | **0.0513*** | **0.0953**** | **0.0894*** | **-0.0899** | **0.1956**** | **0.2377** |
| | (0.143) | (0.097) | (0.685) | (0.209) | (0.052) | (0.038) | (0.053) | (0.176) | (0.018) | (0.648) |
| $Share_{i,t-1}$ | **0.0016** | **-0.0089** | **0.0066** | **0.0023** | **0.0070** | **-0.0007** | **-0.0131*** | **0.0082*** | **0.0020** | **-0.0025** |
| | (0.643) | (0.246) | (0.155) | (0.592) | (0.536) | (0.829) | (0.070) | (0.072) | (0.630) | (0.870) |
| $ABIshare_{i,t-1}$ | **0.0157*** | **0.0227** | **0.0061** | **0.0247**** | **0.0080** | **0.0143*** | **0.0246** | **0.0055** | **0.0255**** | **0.0300** |
| | (0.051) | (0.146) | (0.410) | (0.021) | (0.672) | (0.062) | (0.118) | (0.503) | (0.015) | (0.182) |
| $p0\_5_{i,t}$ | **0.2193** | **-0.3771** | **0.2215** | **0.2871** | **0.2182** | **0.0124** | **-0.8269*** | **2.4672**** | **0.2685** | **0.2073** |
| | (0.287) | (0.176) | (0.448) | (0.101) | (0.487) | (0.974) | (0.066) | (0.047) | (0.626) | (0.796) |
| $p5\_10_{i,t}$ | **-0.0066** | **-0.1392** | **-0.0749** | **-0.1382** | **-0.2061** | **-0.2274** | **-0.5112** | **0.1873** | **-0.4625** | **-2.5662**** |
| | (0.962) | (0.473) | (0.521) | (0.270) | (0.412) | (0.383) | (0.251) | (0.631) | (0.285) | (0.015) |
| $p10\_15_{i,t}$ | **0.0788** | **-0.1920** | **-0.0302** | **0.0711** | **0.1600** | **-0.1623** | **-0.2779** | **-0.4406** | **0.1536** | **-0.5085** |
| | (0.421) | (0.108) | (0.835) | (0.411) | (0.338) | (0.415) | (0.142) | (0.129) | (0.487) | (0.420) |
| $p15\_20_{i,t}$ | **0.0830** | **0.0056** | **0.0202** | **0.0200** | **0.1456** | **0.0421** | **0.2249*** | **-0.2871**** | **0.1806** | **-0.7094** |
| | (0.223) | (0.912) | (0.769) | (0.701) | (0.164) | (0.610) | (0.086) | (0.026) | (0.317) | (0.470) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | | | | **0.1238** | **0.1874*** | **-1.1346*** | **0.1007** | **-0.1229** |
| | | | | | | (0.342) | (0.100) | (0.073) | (0.690) | (0.715) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | | | | **0.0970** | **0.0875** | **0.0182** | **0.1992** | **0.8048**** |
| | | | | | | (0.264) | (0.692) | (0.911) | (0.235) | (0.028) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | | | | **0.0791** | **-0.0710** | **0.2544**** | **-0.0269** | **0.1631** |
| | | | | | | (0.140) | (0.516) | (0.034) | (0.695) | (0.326) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | | | | **0.0027** | **-0.1612*** | **0.1568**** | **-0.0565** | **0.1962** |
| | | | | | | (0.877) | (0.081) | (0.014) | (0.208) | (0.395) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | | | | **-0.0160**** | **-0.0096** | **0.0205** | **-0.0374**** | **-0.0293** |
| | | | | | | (0.030) | (0.483) | (0.193) | (0.028) | (0.746) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | | | | **0.0415** | **0.1779**** | **-0.0297** | **-0.1553***** | **0.1370*** |
| | | | | | | (0.167) | (0.032) | (0.715) | (0.008) | (0.093) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | | | | **-0.0036** | **-0.0125** | **-0.0912** | **-0.1095*** | **-0.1580** |
| | | | | | | (0.896) | (0.885) | (0.152) | (0.052) | (0.154) |
| $R^2$ within | 0.0224 | 0.0357 | 0.0216 | 0.0166 | 0.0636 | 0.0249 | 0.0408 | 0.0321 | 0.0280 | 0.1177 |
| F-statistic | 4.6180 | 3108.0841 | 10.3860 | 2.9751 | 13.9000 | 42.4173 | 100.3199 | 123.4623 | 4.7911 | 7.2867 |
| p-value | 0.0006 | 0.0000 | 0.0000 | 0.0111 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

### 3.3.4. Results using the quarterly frequency

Section 3.2.2 discussed, among other things, the issue of the frequency of observations. The yearly frequency was adopted to overcome some econometric issues. Although using yearly data shows the long-term properties of fund performance, it is possible that it eliminates time patterns that may appear only on a short-term basis. In order to control for this a panel with quarterly frequency is also created. The procedure is identical to the one for the yearly panel where average return and risk are calculated for each calendar quarter from 1980 to 2009. All three monthly observations are required for each quarter, i.e. $n=3$. For funds that opened during a quarter (e.g. in February 1991) the first observation is considered to be the first calendar quarter with all three monthly observations (e.g. second quarter of 1991). Since this is less restricting than the minimum 6 months that the yearly panel required, approximately an extra 100 funds are included in the quarterly panel ending with a total of 5,016 funds and 111,696 observations. Like in the yearly panel, allocation, fixed income, and equity funds make out the vast majority of this sample, i.e. circa 95% of the funds and observations. In particular, there are 381 allocation funds, 743 fixed income funds, and 3,617 equity funds. The Sharpe ratio and the M2 are again subject to outliers which are winsorized. The adjustment is made on 0.5% of the distribution of each measure and applied on both tails.

There is some difference, however, in the summary statistics between the two panels. Table 3.11 shows the average return and sigma of funds and their PPBs for the yearly and quarterly panels.[30] The means and standard deviations of the three performance measures are also included. The averages are fairly similar between the two panels. The main exception is the Sharpe ratio that is considerably higher in the quarterly panel for all samples. The size of each variable's standard deviation is another notable difference between the yearly and the quarterly data. Return and risk vary much more around their mean in the quarterly panel than in the yearly one, e.g. the quarterly standard deviation of M2 is about three times as much as the yearly one. This is expected as part of the frequency smoothing. Observations based on 12-month averages are smoother than observations based on 3-month averages. Consequently, the quarterly panel has more 'noise' than the yearly panel.

[30] The statistics for the yearly panel are taken from Table 3.1.

Table 3.11. Summary statistics for fund and PPB return and sigma, and fund performance measures. Comparison of yearly and quarterly panel.

| Fund Type | Category | Variable | Yearly Mean | Yearly St. Dev. | Yearly Obs. | Quarterly Mean | Quarterly St. Dev. | Quarterly Obs. |
|---|---|---|---|---|---|---|---|---|
| All funds | Fund | Return | 0.404 | 1.841 | 28586 | 0.468 | 3.005 | 111696 |
| | | Sigma | 4.362 | 2.390 | | 3.945 | 3.129 | |
| | PPB | Return | 0.226 | 1.710 | | 0.285 | 2.943 | |
| | | Sigma | 4.252 | 2.400 | | 3.896 | 3.060 | |
| | Performance | Sharpe | 0.038 | 0.416 | | 0.296 | 1.695 | |
| | | $R_{Fund}$-$R_{PPB}$ | 0.178 | 0.824 | | 0.183 | 1.397 | |
| | | M2 | 0.222 | 0.796 | | 0.322 | 2.408 | |
| Allocation Funds | Fund | Return | 0.372 | 1.418 | 1579 | 0.426 | 2.463 | 7999 |
| | | Sigma | 3.428 | 1.626 | | 3.268 | 2.410 | |
| | PPB | Return | 0.167 | 1.330 | | 0.202 | 2.514 | |
| | | Sigma | 3.504 | 1.951 | | 3.380 | 2.618 | |
| | Performance | Sharpe | 0.080 | 0.385 | | 0.459 | 1.742 | |
| | | $R_{Fund}$-$R_{PPB}$ | 0.205 | 0.765 | | 0.224 | 1.169 | |
| | | M2 | 0.287 | 0.756 | | 0.461 | 2.174 | |
| Fixed Income Funds | Fund | Return | 0.442 | 0.952 | 4380 | 0.458 | 1.634 | 17432 |
| | | Sigma | 2.038 | 1.247 | | 1.718 | 1.493 | |
| | PPB | Return | 0.188 | 0.788 | | 0.217 | 1.477 | |
| | | Sigma | 1.944 | 1.073 | | 1.661 | 1.356 | |
| | Performance | Sharpe | 0.001 | 0.397 | | 0.073 | 1.659 | |
| | | $R_{Fund}$-$R_{PPB}$ | 0.254 | 0.861 | | 0.241 | 1.343 | |
| | | M2 | 0.260 | 0.733 | | 0.242 | 2.029 | |
| Equity Funds | Fund | Return | 0.407 | 2.020 | 21072 | 0.482 | 3.292 | 82160 |
| | | Sigma | 5.041 | 2.165 | | 4.598 | 3.154 | |
| | PPB | Return | 0.238 | 1.881 | | 0.306 | 3.214 | |
| | | Sigma | 4.881 | 2.192 | | 4.511 | 3.054 | |
| | Performance | Sharpe | 0.066 | 0.367 | | 0.386 | 1.625 | |
| | | $R_{Fund}$-$R_{PPB}$ | 0.169 | 0.775 | | 0.176 | 1.346 | |
| | | M2 | 0.223 | 0.746 | | 0.365 | 2.397 | |

Each of the three performance measures is regressed on only the constant in order to assess their statistical significance for the quarterly panel. Table 3.12 is a reproduction of Table 3.7 and shows the estimated coefficients of specification (1). The constant coefficient for the Sharpe ratio is as expected much higher than in the yearly panel. Nevertheless, it is not statistically significant for all the samples. It becomes significant at the 10% level for the allocation, the equity, and the UK equity funds and at the 5% for the emerging equity funds. Performance relative to the PPB requires a word of explanation. The constant coefficient for the difference-in-returns measure differs very little for the two panels. However, the constant for the M2 is much higher for the quarterly panel, particularly for the emerging equity funds. The only exception is the fixed income funds where M2 is very similar as indicated by the summary statistics in Table 3.11.

Table 3.12. The estimated constant coefficient for specification (1), sorted by sample and performance measure. The $R^2$-within is in all cases 0 and the F-test for the significance of the regression is not applicable. PPB is the benchmark and the panel has the quarterly structure. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

**Constant Coefficient**

| Sample | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Funds | Obs. |
|---|---|---|---|---|---|
| All funds | **0.2962** | **0.1830*** ** | **0.3217*** ** | 5016 | 111696 |
| | (0.145) | (0.000) | (0.006) | | |
| Allocation Funds | **0.4586*** | **0.2240*** ** | **0.4614*** ** | 381 | 7999 |
| | (0.097) | (0.000) | (0.003) | | |
| Fixed Income Funds | **0.0729** | **0.2410** ** | **0.2422** ** | 743 | 17432 |
| | (0.663) | (0.023) | (0.048) | | |
| Equity Funds | **0.3855*** | **0.1764*** ** | **0.3649*** ** | 3617 | 82160 |
| | (0.077) | (0.000) | (0.002) | | |
| Emerging Equity Funds | **0.5923** ** | **0.1501** ** | **0.7611*** | 186 | 2767 |
| | (0.027) | (0.011) | (0.083) | | |
| International Equity Funds | **0.3402** | **0.1553*** ** | **0.2982*** ** | 1918 | 45250 |
| | (0.103) | (0.007) | (0.004) | | |
| UK Equity Funds | **0.4288*** | **0.2066*** ** | **0.4212*** ** | 1513 | 34143 |
| | (0.066) | (0.000) | (0.006) | | |

The regression results for specification (4) for all unrestricted samples are in in Appendix J. The results under the restriction that fund's age is up to 5 years are not presented or discussed for the quarterly panel as they are very much alike with those without the restriction. Similar to the yearly panel, funds', providers' and market characteristics explain most of the fund performance. In most cases the constant becomes insignificant once all explanatory variables are included. Allocation funds still underperform their PPBs by about 14% for the difference-in-returns and 33% for the M2. The significant underperformance found in the yearly panel for the emerging equity funds becomes insignificant in the quarterly panel. The only other difference between the two panels is that the constant of the UK equity funds remains significant for the Sharpe ratio and M2.

The relationship between performance and fund's age is less strong for the quarterly panel but still appears almost entirely through the interactions between fund's age and provider's age. One important exception is the M2 for the emerging equity funds. The coefficient of the fund's age function is significant for all specifications except the linear. The sign is positive indicating a concave relationship between M2 and the fund's age. The lower observation frequency brings out the clear catching-up pattern that emerging equity funds follow. The other exception is the difference-in-returns for the UK equity funds where results give a slight indication of a concave relationship as well (for the logarithmic and the cubic root functions).

The effects of the other variables on performance are fairly similar to those found for the yearly panel. However, there are two results that should be pointed out. First, the regulatory change dummies are more significant in the quarterly panel but the results still agree with those from the yearly panel and with the stated hypotheses. For example, the international and the UK equity funds appear to have a significantly lower Sharpe ratio following the introduction of personal pension plans whereas the performance of the allocation funds increased. This is consistent with the hypothesis that there was a shift from single to multiple asset portfolios.

The second result relates to market conditions. In the yearly panel, it is most often the case that only the bear market dummy is significant and affects the Sharpe ratio rather than the performance relative to the PPB (in the unrestricted regressions). In the quarterly panel, both the bear and bull market dummy have a significant effect on the Sharpe ratio. In almost all samples, the decrease in the Sharpe ratio under bear market conditions is lower than the increase under bull market conditions. The fixed income funds are the only exception, where only the bull market dummy has a significantly positive effect on the Sharpe ratio. Moreover, market conditions affect the performance relative to the PPB as well. The difference-in-returns measure increases in years with a bearish climate for most samples but is unchanged in years with bull markets.[31] This may seem good news since in raw terms funds score higher returns than their PPBs when the markets are going down. However, there is indication that the M2 actually decreases in bear years for all samples except the fixed income and the UK equity funds. Therefore, in risk-adjusted terms funds underperform their PPBs under bear conditions.

Finally, it should be noted that as market conditions become more significant with the higher observation frequency, provider characteristics become less significant. The positive effect of the ABI's share on performance relative to the PPB remains. This 'shift' in significance is indicative of what is important over different time horizons. In the short-run performance is more affected by temporary market changes. However, in the long-run factors that proxy resources, specialization, and experience are more important for fund performance.

[31] The difference-in-returns for the emerging and the UK equity funds is unaffected by both the bear and the bull market dummies.

### 3.3.5. Results with the FTSE All Shares index as benchmark

So far, fund performance has been discussed relative only to the PPB. In this part, the performance of equity funds is analysed relative to the FTSE All Shares index as well. This serves primarily comparison purposes, i.e. it brings the findings for performance relative to the PPB into some perspective. Moreover, it is not unreasonable to assume that performance of these equity funds relative to the domestic stock market has some informational quality particularly for policyholders.

The methodology from the previous part is applied here as well. The equity sample is separated into its three subsamples. The return and risk information for the FTSE index is available for the entire period of observation unlike the corresponding information for the PPBs. Therefore, there are more observations for performance relative to the FTSE than to the PPB. In order to avoid this mismatch, the sample with the FTSE is restricted to the size of the sample with the PPB so that the results are 1:1 comparable. Note that the M2 against the FTSE is also winsorized (0.5% from both tails).

Table 3.13 shows the characteristics of equity funds in comparison to those of the FTSE All Shares index. It contains the results of t-tests examining whether there is a statistically significant difference between the average returns and risk of the equity funds from those of the FTSE All Shares index. The results for the yearly panel are in the upper half of Table 3.13 and below there are the results for the quarterly panel. All types of equity funds have significantly higher average returns than that of the FTSE index. The largest difference is for the emerging equity funds at around 12.7%. The international and the UK equity funds have a similar difference from the FTSE; 3.04 and 2.43 accordingly. The more interesting feature is the difference in risk. The funds' average risk is much higher than the FTSE risk. Moreover, this difference in average risk is markedly higher than the difference in average returns. Consequently, the risk-adjusted outperformance is very similar to the non-risk-adjusted one, unlike performance relative to the PPB. This is yet another point indicating that there may be some PPB selection issues in the industry.

Table 3.13. Results of t-tests on the difference of mean return and sigma between fund and the FTSE All Shares index (unequal variances) and of t-tests on mean difference-in-returns and M2-FTSE equalling 0. The tests are carried out for the yearly and the quarterly panels.

| Sample | Null Hypothesis | Variable | Mean | St. Error | t-statistic | p-value | Obs. |
|---|---|---|---|---|---|---|---|
| *Yearly Panel* | | | | | | | |
| Equity Funds | Difference in Means=0 | Return | 0.255 | 0.019 | 13.740 | 0.0000 | 21072 |
| | | Sigma | 0.918 | 0.019 | 48.765 | 0.0000 | |
| | Mean=0 | $R_{Fund}$-$R_{FTSE}$ | 0.255 | 0.008 | 32.735 | 0.0000 | |
| | | M2-FTSE | 0.279 | 0.007 | 41.636 | 0.0000 | |
| Emerging Equity Funds | Difference in Means=0 | Return | 0.995 | 0.150 | 6.646 | 0.0000 | 714 |
| | | Sigma | 2.920 | 0.119 | 24.486 | 0.0000 | |
| | Mean=0 | $R_{Fund}$-$R_{FTSE}$ | 0.995 | 0.073 | 13.656 | 0.0000 | |
| | | M2-FTSE | 0.904 | 0.038 | 24.043 | 0.0000 | |
| International Equity Funds | Difference in Means=0 | Return | 0.251 | 0.024 | 10.415 | 0.0000 | 11611 |
| | | Sigma | 1.212 | 0.026 | 47.489 | 0.0000 | |
| | Mean=0 | $R_{Fund}$-$R_{FTSE}$ | 0.251 | 0.012 | 21.220 | 0.0000 | |
| | | M2-FTSE | 0.260 | 0.011 | 24.611 | 0.0000 | |
| UK Equity Funds | Difference in Means=0 | Return | 0.200 | 0.029 | 6.971 | 0.0000 | 8747 |
| | | Sigma | 0.364 | 0.027 | 13.573 | 0.0000 | |
| | Mean=0 | $R_{Fund}$-$R_{FTSE}$ | 0.200 | 0.008 | 24.836 | 0.0000 | |
| | | M2-FTSE | 0.254 | 0.007 | 35.383 | 0.0000 | |
| *Quarterly Panel* | | | | | | | |
| Equity Funds | Difference in Means=0 | Return | 0.272 | 0.015 | 17.845 | 0.0000 | 82160 |
| | | Sigma | 0.766 | 0.014 | 56.407 | 0.0000 | |
| | Mean=0 | $R_{Fund}$-$R_{FTSE}$ | 0.272 | 0.007 | 40.526 | 0.0000 | |
| | | M2-FTSE | 0.340 | 0.012 | 29.115 | 0.0000 | |
| Emerging Equity Funds | Difference in Means=0 | Return | 1.079 | 0.107 | 10.042 | 0.0000 | 2767 |
| | | Sigma | 2.776 | 0.093 | 29.735 | 0.0000 | |
| | Mean=0 | $R_{Fund}$-$R_{FTSE}$ | 1.079 | 0.058 | 18.598 | 0.0000 | |
| | | M2-FTSE | 1.114 | 0.057 | 19.388 | 0.0000 | |
| International Equity Funds | Difference in Means=0 | Return | 0.268 | 0.021 | 13.025 | 0.0000 | 45250 |
| | | Sigma | 1.081 | 0.019 | 57.968 | 0.0000 | |
| | Mean=0 | $R_{Fund}$-$R_{FTSE}$ | 0.268 | 0.010 | 26.187 | 0.0000 | |
| | | M2-FTSE | 0.298 | 0.017 | 17.227 | 0.0000 | |
| UK Equity Funds | Difference in Means=0 | Return | 0.213 | 0.023 | 9.258 | 0.0000 | 34143 |
| | | Sigma | 0.185 | 0.019 | 9.564 | 0.0000 | |
| | Mean=0 | $R_{Fund}$-$R_{FTSE}$ | 0.213 | 0.007 | 29.005 | 0.0000 | |
| | | M2-FTSE | 0.334 | 0.016 | 21.413 | 0.0000 | |

Table 3.13 also shows that all types of the equity funds significantly outperform the FTSE All Shares index. The average difference-in-returns and the average M2 are significantly different from 0 for all samples. However, the regression results of specification (1) shown in Table 3.14 show that the international equity funds do not outperform the FTSE All Shares index. The only exception is the risk-adjusted outperformance in the quarterly panel which is statistically significant at the 10%. Still, it is lower than the outperformance of both the emerging and the UK equity funds. The emerging equity funds are by far the highest performing equity funds.

Table 3.14. The estimated constant coefficient for specification (1), sorted by panel, sample, and performance measure. The $R^2$-within is in all cases 0 and the F-test for the significance of the regression is not applicable. The FTSE All Shares index is the benchmark. The estimated coefficients for the yearly and quarterly panel are presented. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

**Constant Coefficient**

| Sample | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | Funds | Obs. |
|---|---|---|---|---|
| *Yearly Panel* | | | | |
| Equity Funds | **0.2549*** ** | **0.2794** ** | 3571 | 21072 |
| | (0.001) | (0.042) | | |
| Emerging Equity Funds | **0.9951*** ** | **0.9036*** ** | 183 | 714 |
| | (0.005) | (0.000) | | |
| International Equity Funds | **0.2509** | **0.2599** | 1892 | 11611 |
| | (0.120) | (0.235) | | |
| UK Equity Funds | **0.1997*** ** | **0.2543*** ** | 1496 | 8747 |
| | (0.001) | (0.000) | | |
| *Quarterly Panel* | | | | |
| Equity Funds | **0.2723*** ** | **0.3404*** ** | 3617 | 82160 |
| | (0.006) | (0.005) | | |
| Emerging Equity Funds | **1.0795** ** | **1.1139*** ** | 186 | 2767 |
| | (0.023) | (0.003) | | |
| International Equity Funds | **0.2680** | **0.2977* ** | 1918 | 45250 |
| | (0.124) | (0.076) | | |
| UK Equity Funds | **0.2127** ** | **0.3342** ** | 1513 | 34143 |
| | (0.018) | (0.040) | | |

Tables 3.15.A-B show the regression results of specification (4) for the all equity, the emerging, the international, and the UK equity samples using the square root function.[32] The first table presents the results from the yearly panel whereas the second those from the quarterly panel. Appendix K reports the same results for the other three age functions.

The impressive outperformance of the emerging equity funds turns insignificant and in two occasions M2 becomes negative. The insignificant outperformance of the international equity funds turns to significant underperformance. For both the yearly and the quarterly panels the constant coefficient for M2 ranges between -26% and -34% so that international funds definitely underperform the domestic stock market. However, the UK equity funds do better. The constant for M2 in the quarterly panel is positive and significant at the 5% level (although in the yearly panel it is insignificant). Still, it should be reminded that the results of the quarterly panel have to be treated with care since they contain more noise than those of the yearly panel.

The results for the all equity sample show very little explanatory power. Particularly for the yearly panel there are only two coefficients out of all regressions that are statistically significant but these do not persist across different specifications. There is more to be said about the quarterly panel results. The regressions for the difference-in-returns measure of performance have little or no statistical significance but, the M2 regressions are highly significant. The PPB bull market dummy has a very strong effect on M2. When the fund's PPB market goes through a bullish period, these funds outperform the FTSE by about 0.9%. At the same time performance doesn't change during a PPB bear period. Thus, even if there is poor timing relative to the PPB (indicated by results in the previous part) managers seem to do better relative to the FTSE under changing conditions.

There is no direct relationship between M2 and fund's age or an indirect one with the provider's age interactions. The only exception is the interaction with the 15-20 year old provider dummy which is significant using the logarithmic function and only marginally insignificant for the other age functions. This interaction has a negative sign implying a

[32] These results refer to the unrestricted samples. The results under the restriction that fund's age is up to 5 years are very similar for both yearly and quarterly panels and are not shown for brevity.

slightly convex relationship between M2 and fund's age for providers that are 15-20 years old relative to the 20+ group. Of course, as this is marginally significant at the 10% level it is not considered to be hard evidence. Nevertheless, there is one point to be made. There is practically no change in performance relative to the FTSE over time whereas equity funds are found to catch-up with their PPBs. No matter if there are PPB selection issues, managers seem to really take care how funds perform relative to the PPB whereas performance relative to the domestic stock market appears to be far less important.

The interaction between the fund's age and the PPB bear dummy has a positive sign for the M2. Given that there is no relationship between M2 and fund's age, this coefficient means that older funds do better relative to the FTSE than younger funds when the PPB market is bearish. This is an indication that experience matters when it comes to handling changing market conditions.

Contrary to the all equity sample, the results for the subsamples are very rich. The yearly panel results for the emerging equity funds show that performance relative to the FTSE has a direct concave relationship to fund's age. This relationship is much stronger for the risk-adjusted outperformance and suggests that emerging equity funds need time to catch-up with the FTSE. This may well be expected particularly in view that emerging equity is one of the youngest investment styles. Consequently, there is a period of adjustment as in Bauer et al. (2005) during which knowledge and experience need to be accumulated in order to catch up with the more established domestic equity market.

Nevertheless, there is one group of providers whose funds' performance has a convex relationship with fund's age. The 0-5 year old dummy is positive and statistically significantly different from the 20+ group for all specifications. Providers that are up to 5 years old significantly outperform the FTSE relative to the oldest providers both in raw and risk-adjusted terms. Moreover, the interaction between this dummy and fund's age is significant for all specifications and has a negative sign as the main hypothesis would predict. Note that the difference-in-returns and the M2 for all providers (direct relationship) have almost equal slopes (1.0164 and 1.001).

These results reveal how differently young funds perform when they are operated by a young provider. Particularly the shape of the difference-in-returns is what the main hypothesis predicts: initial outperformance which gradually settles down at a lower level. Although the direct relationship with fund's age does not appear in the quarterly sample the interaction with the young providers' group does. It seems that providers who have recently entered this industry put in an effort to make their newly opened emerging equity fund shine relative to the FTSE – at least more so than providers that are more than 20 years old. Note that a similar result was found for performance relative to the PPB although the relationship was found only for the difference-in-returns and was less strong. Perhaps, performance relative to the domestic stock market is perceived to be more effective in attracting policyholders than performance relative to the PPB for emerging equity funds.

Concerning market conditions, bear markets have a negative effect on outperformance whereas bull markets don't. This negative effect is stronger for the quarterly panel. The interaction between the bear market dummy and fund's age is positive, consistent with the hypothesis that managers try harder and catch up faster under bearish conditions (given the overall concave relationship with fund's age).

Finally, there is indication that the provider's size has a positive effect and the provider's market share a negative effect on fund performance. These results are consistent with what is found for performance relative to the PPB implying that availability of resources (size) and competition (market share) have an impact on fund performance no matter what the benchmark is.

The results for international equity funds show that their performance relative to the FTSE is not directly related to fund's age. Particularly the yearly panel results indicate that mostly market conditions can make a difference. Bear market conditions appear to have a positive effect on M2. Given that international equity funds generally underperform the FTSE (constant of about -24%) this means that underperformance is reduced under bearish conditions. At the same time, the quarterly panel results show that funds reduce their underperformance during bull years. A possible explanation for this is the high correlation between international stock markets (Bartran and Bodnar, 2009) so that a bear/bull PPB market probably means that there is bear/bull FTSE market as well. Thus, the performance of international equity funds comes closer to the performance of the FTSE (on risk-adjusted terms) under such market conditions.

Another point that exists in both panels is that the ABI’s share within the provider has a positive effect on performance, which also appeared for performance relative to the PPB. This is again a case where a provider characteristic can have a general effect on fund performance irrespective of what the benchmark is.

The provider’s age dummies show that younger providers perform better (or underperform less) relative to the FTSE than older providers. Providers that are up to 5 years old have no statistically different performance from the 20+ group. However, providers that are between 5 and 10 years old have the lowest risk-adjusted underperformance at approximately -12.7%. Providers between 10 and 15 years old underperform by about -15% and providers that are between 15 and 20 years old underperform by about -21% (all relative to the 20+ group).

From the interactions between the provider’s age dummies and the fund’s age only that of the 15-20 year group is significantly different from the 20+ group. The coefficient is negative indicating a convex relationship between M2 and fund’s age for these providers. Considering that they are already underperforming the FTSE by 21% this means that the underperformance widens with fund’s age in comparison to that of 20+ year old providers. Interestingly, this convex relationship for the specific age group appears relative to the PPB as well. This indicates that there is some effort at the beginning of the fund’s life which eventually diminishes but this change does not happen for younger providers. Maybe old providers can afford to reduce their effort once they consider the fund’s reputation to be sufficiently established more than younger providers do.

The results for the UK equity funds are very similar to the corresponding ones with the PPB as benchmark. It is reasonable to expect that many of the funds investing in UK equity use the FTSE All Shares index as a PPB. Moreover, any other FTSE index used as a PPB e.g.

FTSE 100, has a high correlation with the FTSE All Shares index and thus, it will make little difference which of the two is used as benchmark.

Performance is again related to fund's age through its interaction with the 10-15 year old provider dummy. Additionally, the results for the yearly panel show that providers up to 5 years old have a significant interaction with fund's age. The relationship between fund performance and fund's age is concave indicating that inexperienced providers go through a catching up period relative to the 20+ group. However, they seem to catch up faster than the 10-15 year old providers; the coefficient of their interaction with fund's age is in all cases higher than that of the older group. Hence, there is again consistency with the hypothesis that younger providers put in more effort to perform well than older providers, based on the assumption that news about their performance is more valuable to the market.

Table 3.15.A. Results for the equity fund samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The FTSE All Shares index is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | Emerging | | International | | UK | |
|---|---|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| ***Constant*** | **-0.3696** | **-0.4618** | **-0.6905** | **-1.1414*** | **-1.4738** | **-1.8229*** | **0.4878** | **0.5642** |
| | (0.541) | (0.443) | (0.432) | (0.056) | (0.132) | (0.072) | (0.311) | (0.199) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0949** | **0.0601** | **0.8841** | **0.8191**** | **0.2913** | **0.1463** | **-0.0719** | **0.0093** |
| | (0.528) | (0.729) | (0.107) | (0.029) | (0.261) | (0.577) | (0.396) | (0.919) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.0706** | **0.4517** | **-3.9421***** | **-0.6764** | **0.6250** | **1.1893*** | **-0.3017*** | **-0.0559** |
| | (0.757) | (0.242) | (0.000) | (0.112) | (0.210) | (0.055) | (0.060) | (0.813) |
| $\boldsymbol{Bull_{i,t}}$ | **0.2887** | **0.0756** | **0.3591** | **0.2052** | **0.6639*** | **0.5126** | **-0.0463** | **-0.2909** |
| | (0.175) | (0.771) | (0.509) | (0.736) | (0.056) | (0.123) | (0.767) | (0.174) |
| $\boldsymbol{Size_{i,t-1}}$ | **-0.0086** | **-0.0537** | **0.0432** | **0.1227** | **-0.0561** | **-0.0440** | **-0.0065** | **-0.0770** |
| | (0.931) | (0.598) | (0.831) | (0.180) | (0.801) | (0.819) | (0.911) | (0.231) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0083** | **-0.0069** | **0.0227** | **-0.0002** | **0.0048** | **-0.0255** | **0.0147*** | **0.0089** |
| | (0.451) | (0.446) | (0.259) | (0.986) | (0.890) | (0.366) | (0.075) | (0.229) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0047** | **0.0054** | **-0.0620** | **-0.0750** | **0.0269** | **0.0342**** | **0.0003** | **0.0005** |
| | (0.696) | (0.652) | (0.352) | (0.153) | (0.155) | (0.047) | (0.979) | (0.947) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.1944** | **0.6428** | **5.1746***** | **4.0275***** | **1.0859** | **1.2821** | **-0.7544**** | **0.0577** |
| | (0.720) | (0.204) | (0.000) | (0.000) | (0.289) | (0.197) | (0.040) | (0.854) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.2137** | **0.3336** | **-2.5628** | **0.4064** | **0.2406** | **0.6750** | **-0.3159** | **0.1998** |
| | (0.630) | (0.383) | (0.469) | (0.796) | (0.734) | (0.293) | (0.295) | (0.483) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.2144** | **-0.1498** | **-0.2993** | **0.7148** | **0.3329** | **0.3284** | **-0.8051***** | **-0.7209***** |
| | (0.624) | (0.728) | (0.643) | (0.294) | (0.638) | (0.616) | (0.000) | (0.000) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.0975** | **0.0529** | **-0.0989** | **0.9715** | **-0.0909** | **0.1361** | **-0.1459** | **-0.0403** |
| | (0.673) | (0.814) | (0.909) | (0.147) | (0.798) | (0.702) | (0.357) | (0.748) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.1561** | **-0.0468** | **-2.9970***** | **-1.3084***** | **-0.3206** | **-0.4172** | **0.4894*** | **0.0804** |
| | (0.517) | (0.855) | (0.000) | (0.008) | (0.515) | (0.418) | (0.051) | (0.709) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **0.1382** | **-0.0407** | **2.8193** | **1.2893** | **-0.0022** | **-0.1444** | **0.0215** | **-0.1567** |
| | (0.267) | (0.764) | (0.175) | (0.144) | (0.993) | (0.509) | (0.888) | (0.357) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **0.0901** | **0.0974** | **0.2901** | **0.0935** | **-0.0751** | **-0.0476** | **0.2419***** | **0.2403***** |
| | (0.471) | (0.433) | (0.467) | (0.793) | (0.722) | (0.802) | (0.001) | (0.001) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **0.0043** | **-0.0121** | **-0.2884** | **-0.4046** | **0.0135** | **-0.0176** | **0.0273** | **0.0116** |
| | (0.947) | (0.846) | (0.465) | (0.112) | (0.892) | (0.857) | (0.653) | (0.834) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **0.0037** | **0.0175** | **-0.0037** | **-0.0194** | **0.0179** | **0.0205** | **-0.0024** | **0.0164** |
| | (0.847) | (0.379) | (0.941) | (0.436) | (0.673) | (0.569) | (0.826) | (0.171) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.0565** | **0.0543** | **0.5691***** | **0.1502** | **-0.0852** | **-0.0405** | **0.0779**** | **0.0491** |
| | (0.479) | (0.363) | (0.002) | (0.269) | (0.416) | (0.660) | (0.025) | (0.262) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **-0.0234** | **-0.0072** | **-0.1677** | **-0.2139** | **-0.0751** | **-0.0786** | **-0.0022** | **0.0263** |
| | (0.653) | (0.898) | (0.336) | (0.171) | (0.357) | (0.302) | (0.954) | (0.608) |
| $\boldsymbol{PPP_t}$ | **0.2890** | **0.5177** | | | **0.8242** | **1.3098** | **-0.2035** | **-0.1926** |
| | (0.609) | (0.369) | | | (0.352) | (0.170) | (0.599) | (0.591) |
| $\boldsymbol{STK_t}$ | **-0.1166** | **-0.0533** | **0.4537** | **0.4758** | **-0.3597** | **-0.1164** | **0.1198** | **0.0512** |
| | (0.696) | (0.835) | (0.643) | (0.495) | (0.412) | (0.728) | (0.531) | (0.770) |
| $R^2$ within | 0.0148 | 0.0770 | 0.5654 | 0.3389 | 0.0374 | 0.1515 | 0.0216 | 0.0579 |
| F-statistic | 6.6348 | 17.3198 | 4851374.58 | 6492.9893 | 14.3008 | 4.3257 | 20.6857 | 26.7723 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0002 | 0.0000 | 0.0000 |
| Funds | 3571 | 3571 | 183 | 183 | 1892 | 1892 | 1496 | 1496 |
| Observations | 20985 | 20985 | 713 | 713 | 11574 | 11574 | 8698 | 8698 |

Table 3.15.B. Results for the equity fund samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The FTSE All Shares index is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | Emerging | | International | | UK | |
|---|---|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| ***Constant*** | **0.0070** | **-0.3582** | **0.2562** | **-0.2049** | **-0.8073** | **-2.4981**** | **0.7994** | **2.0559**** |
| | (0.992) | (0.636) | (0.838) | (0.869) | (0.444) | (0.042) | (0.110) | (0.026) |
| $f(age_{i,t})$ | **-0.0567** | **0.0301** | **0.5481** | **-0.1039** | **0.0200** | **0.1925** | **-0.1577** | **-0.0650** |
| | (0.758) | (0.876) | (0.399) | (0.841) | (0.935) | (0.482) | (0.209) | (0.688) |
| $Bear_{i,t}$ | **-0.3701** | **-0.0528** | **-4.2509***** | **-1.4949*** | **-0.0481** | **0.3505** | **-0.3373** | **-0.4517** |
| | (0.114) | (0.884) | (0.000) | (0.062) | (0.856) | (0.458) | (0.412) | (0.490) |
| $Bull_{i,t}$ | **-0.0704** | **0.8600***** | **-0.6446** | **-0.0514** | **0.0548** | **1.1914***** | **-0.2094** | **0.4567** |
| | (0.759) | (0.000) | (0.377) | (0.941) | (0.803) | (0.008) | (0.566) | (0.263) |
| $Size_{i,t-1}$ | **0.0417** | **-0.0097** | **0.1504** | **0.2620** | **0.0463** | **0.2103** | **0.0083** | **-0.2886** |
| | (0.584) | (0.923) | (0.576) | (0.418) | (0.754) | (0.104) | (0.904) | (0.127) |
| $Share_{i,t-1}$ | **-0.0061** | **-0.0075** | **-0.0044** | **-0.0723***** | **-0.0157** | **-0.0319** | **-0.0007** | **0.0101** |
| | (0.635) | (0.579) | (0.864) | (0.003) | (0.739) | (0.464) | (0.941) | (0.480) |
| $ABIshare_{i,t-1}$ | **0.0009** | **0.0126** | **-0.0141** | **0.1306** | **0.0130** | **0.0779**** | **0.0013** | **-0.0167** |
| | (0.942) | (0.381) | (0.904) | (0.280) | (0.708) | (0.034) | (0.908) | (0.355) |
| $p0\_5_{i,t}$ | **0.5390** | **0.1006** | **4.5603***** | **7.4398***** | **0.8421** | **0.1693** | **-0.2009** | **-0.8403** |
| | (0.235) | (0.890) | (0.004) | (0.000) | (0.191) | (0.871) | (0.551) | (0.315) |
| $p5\_10_{i,t}$ | **-0.3341** | **0.6119** | **-2.5102** | **0.3548** | **-0.0755** | **1.3956*** | **-0.2643** | **-0.1896** |
| | (0.531) | (0.288) | (0.406) | (0.889) | (0.905) | (0.067) | (0.473) | (0.713) |
| $p10\_15_{i,t}$ | **0.0227** | **0.1837** | **0.3772** | **0.9979** | **0.5831** | **1.1679** | **-0.6897**** | **-0.9570**** |
| | (0.964) | (0.733) | (0.837) | (0.514) | (0.404) | (0.107) | (0.016) | (0.019) |
| $p15\_20_{i,t}$ | **-0.0309** | **0.4005** | **-0.5034** | **-0.1356** | **0.0715** | **0.7954*** | **-0.2036** | **0.0067** |
| | (0.913) | (0.187) | (0.725) | (0.893) | (0.858) | (0.066) | (0.257) | (0.979) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **-0.1993** | **0.1574** | **-2.2935**** | **-2.6000**** | **-0.4198** | **0.2798** | **0.0369** | **0.0847** |
| | (0.342) | (0.653) | (0.013) | (0.028) | (0.209) | (0.594) | (0.848) | (0.821) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.1134** | **-0.1790** | **2.3245** | **2.1608** | **-0.0065** | **-0.4314** | **-0.0223** | **-0.1474** |
| | (0.486) | (0.363) | (0.215) | (0.186) | (0.979) | (0.172) | (0.854) | (0.461) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.0120** | **-0.0188** | **0.1327** | **0.8262** | **-0.2208** | **-0.3101** | **0.2042***** | **0.2129*** |
| | (0.931) | (0.902) | (0.849) | (0.162) | (0.315) | (0.200) | (0.005) | (0.051) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0194** | **-0.1291** | **-0.0556** | **0.2603** | **-0.0624** | **-0.2158*** | **0.0499** | **-0.0554** |
| | (0.804) | (0.107) | (0.925) | (0.590) | (0.601) | (0.099) | (0.225) | (0.545) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0078** | **0.0153** | **-0.0519** | **-0.0929** | **-0.0036** | **-0.0212** | **-0.0063** | **0.0614*** |
| | (0.630) | (0.472) | (0.413) | (0.207) | (0.882) | (0.379) | (0.626) | (0.076) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0557** | **0.1094**** | **0.3310*** | **0.2238** | **-0.0422** | **0.1269** | **0.0759** | **0.0072** |
| | (0.392) | (0.045) | (0.071) | (0.178) | (0.554) | (0.124) | (0.175) | (0.895) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **0.0521** | **0.0089** | **0.2232** | **0.1915** | **0.0790** | **0.0415** | **-0.0027** | **-0.1053** |
| | (0.229) | (0.885) | (0.249) | (0.217) | (0.115) | (0.575) | (0.955) | (0.222) |
| $PPP_t$ | **0.3101** | **-0.1730** | | | **0.9088** | **0.5893** | **-0.2553** | **-1.1123*** |
| | (0.587) | (0.771) | | | (0.280) | (0.518) | (0.556) | (0.086) |
| $STK_t$ | **0.0850** | **0.2376** | **0.6608** | **1.6200** | **-0.0855** | **0.0850** | **0.2404** | **0.4439** |
| | (0.849) | (0.624) | (0.613) | (0.144) | (0.895) | (0.904) | (0.289) | (0.282) |
| $R^2$ within | 0.0048 | 0.0179 | 0.2654 | 0.0622 | 0.0083 | 0.0334 | 0.0100 | 0.0166 |
| F-statistic | 1.5290 | 3.1725 | 7.1484 | 5.9471 | 0.9310 | 2.4813 | 3.5268 | 2.2622 |
| p-value | 0.0877 | 0.0001 | 0.0000 | 0.0000 | 0.5466 | 0.0016 | 0.0000 | 0.0042 |
| Funds | 3617 | 3617 | 186 | 186 | 1918 | 1918 | 1513 | 1513 |
| Observations | 82149 | 82149 | 2767 | 2767 | 45246 | 45246 | 34136 | 34136 |

## 3.4. Discussion

The primary objective of this chapter was to explore whether fund performance changes with the fund's age. The main hypothesis states that fund performance is at its highest when funds are young. The premise for this conjecture is in the career concern theory which stresses the importance of good news when there is no or limited information about the past performance. Following from this it can be expected that superior performance of funds is particularly important when they are young, and therefore they may deliver better results at the beginning of their operational life, than when they are 'mature'.

There are several points that emerged from the analysis presented. First, descriptive statistics show that funds in the UK personal pension fund industry outperform their benchmarks. Regression analysis shows that the chosen variables explain most of this outperformance.

Second, controlling for market conditions is more important for a performance measure such as the Sharpe ratio than performance relative to a benchmark. Moreover, bear market conditions seem to affect performance more strongly than bull market conditions and, overall, there is a slight indication that managers have poor timing skills. This, however, seems not to be the case for younger funds. Using the restriction that funds are up to 5 years old shows that funds can outperform (although only in nominal terms) their benchmarks in bear markets, but most importantly outperform their benchmarks in bull markets. As such, poor timing may be more relevant the older a fund becomes.

Third, fund provider's characteristics covary with fund performance. The most prominent result obtained both in the analysis with and without the restriction on fund's age, is that fund performance increases with provider's size and with the degree of the provider's specialization in the fund's investment style. These provider's characteristics are among the most important explanatory variables.

Fourth, the regulatory changes have had an effect on fund performance. The introduction of personal pension funds appears to have positively affected performance of the allocation funds. The introduction of stakeholder schemes has had a negative effect on performance of the international equity funds and the young emerging equity funds. However, it positively impacted on the performance of the UK equity funds.

The last and most important point is that performance is related to fund's age but this relationship exists almost exclusively through the interaction between fund's age and provider's age. Fund's age is individually significant for the fixed income and the emerging equity funds when all the available observations are used in the analysis, but becomes significant for all the investment types if only the first five years of a fund's life are used in the analysis. Taken as a whole, the relationship between performance and fund's age is convex for the fixed income funds, as the main hypothesis predicts, but it is concave for the equity funds. Nevertheless, the concave shape is not inconsistent with the hypothesis. A possible explanation of the concave shape is offered by Bauer et al. (2005). They argue that funds need some time to 'catch-up' with their benchmarks possibly due to learning. The fact that funds eventually catch-up and settle at higher levels indicates that there was increased effort at the beginning of the fund's operations which subsided once fund performance reached a certain level.

Fund performance varies over time and the way it changes is related to the value of information which decreases with time. Provider's age is found to be a very important factor in this. Overall, there seems to be a balance between effort and experience where younger providers put in more effort but lack experience and older providers put in potentially less effort but are more experienced. The relationship between fund performance and fund's age changes according to the age of the provider. The shift in this balance between effort and experience depends on whether the restriction on fund's age is imposed or not.

This chapter makes several contributions. On a practical level, it provides empirical evidence that defined contribution pension schemes on average outperform their benchmarks – although some benchmark selections issues may be possible. This has implications for employees wanting to choose between different options for their pension provision. It has also implications for policymakers particularly in view of the increasing trend to close defined benefit plans and replace them with defined contribution schemes.

Moreover, it contributes to related research on fund performance in various ways. First, it provides evidence that fund's age is important and should not be overlooked. Particularly the first years of fund performance should be included in the analysis as they differ from the latter periods in the fund's life. Additionally, the analysis proposes three ways to assess fund performance that are outside the CAPM-APT framework. These are especially useful in absence of detailed information on the fund's portfolio allocation.

There are also some limitations of the provided analysis all arising from a lack of information. First, the experience of the fund manager is not controlled for. This could be proxied by the age of the manager, the length of tenure in the fund, the career length, education etc. These are factors that are found to have an effect on fund performance (Golec, 1996; Chevalier and Ellison, 1999a) and would make for a more complete model. Second, the size of the fund measured by assets under management could also be a valuable addition. A review by Musalem and Pasquini (2009) documents that size measured in this way plays a role. Moreover, Ippolito and Turner (1987), Ambachtsheer et al. (1998), and Blake et al. (1998) show that fund size has a positive effect on risk-adjusted fund returns. Third, the performance is not measured net of fees. However, there is work that shows how outperformance can disappear or turn into underperformance when fees are accounted for (Daniel et al., 1997; Wermers, 2000; Tonks, 2005). Nevertheless, this relates to the assessment of general performance and may not be an important omission here. If fees do not change with time, the same relationship with fund's age should be observed gross or net of fees.

Finally, the findings of this chapter open the way for further research. First, future work can investigate in detail how learning is related to main hypothesis. This would involve a method that approximates effort, for example, by measuring the rate of catching-up. It would also be of interest (particularly within an agency theory framework) to examine which factors affect this rate e.g. managerial compensation. Moreover, peer analysis may reveal new dimensions in the time pattern that performance follows. This can be done on two levels. First, performance could be measured against an industry average e.g. sector averages provided by the ABI. Second, performance of new funds could be measured against performance of old funds with similar characteristics. Lastly, the findings in this chapter indicated that there may be some issues with benchmark selection. Future work may investigate how benchmarks are chosen, e.g. how often an index is included in a benchmark, what are the differences between the fund's portfolio and the selected benchmark etc.

# CHAPTER 4: PERFORMANCE AND OUTSOURCING

This chapter studies the role of outsourcing in the UK personal pension fund industry. The first section discusses outsourcing within economic theory and goes over to literature looking at its application in fund management. It concludes with the hypothesis that internally and externally managed funds are expected to have the same risk-adjusted performance. Moreover, the performance of each group is expected to have the same relationship with fund's age. The second section documents the development of outsourcing in this sector and shows that although it is a comparatively recent phenomenon it has become the dominant management practice. Additionally, it describes the methodology used to test the main two hypotheses and provides some descriptive statistics to compare the performance of internally and externally managed funds. The last section reports the results of regression analysis and concludes with a discussion of current limitations and future research directions.

## 4.1. Literature review and hypothesis statement

Outsourcing is generally understood to be the purchase of services from an external agent as opposed to delivering these services within the 'buyer' organisation. The external agent can be domestic or foreign. In the latter case outsourcing is also known as 'offshoring' (Olsen, 2006) and is the subject of intense debate and certainly more controversial than outsourcing domestically (Samuelson, 2004; Mankiw and Swagel, 2006). In any case, outsourcing can add value to a company in various ways, such as reducing costs and accessing skills that are not available internally (Bryce and Useem, 1998). The external agent benefits as well mainly through economies of scale achieved by bringing together services offered to different companies (Loh and Venkatraman, 1992; Bryce and Useem, 1998).

Outsourcing in the fund management framework falls under the theory of management delegation. The larger part of related literature explores issues arising from delegating decisions to an internal manager (e.g. Palomino and Prat, 2003; Stracca, 2006; Basak et al., 2007). Nevertheless, delegating fund management to external professionals is considered to be even more complicated. Lakonishok et al. (1992) study US pension funds whose trustees commission money managers instead of hiring in-house professionals. They argue that this creates a ‘double agency’ problem where the employee delegates pension fund management to the trustees, who in turn delegate the investment decisions to an external manager.

Despite this double agency problem, this type of management has been on the rise particularly in the US, the Netherlands, and the UK (Shackleton, 2011). For example, Tkac (2007) points out that one of the recent innovations in the US mutual fund industry is the use of ‘subadvisory contracts’. Hiring independent wealth management companies has been on the rise: Tkac reports that 17% of mutual funds had such arrangement in 2006 compared to 12% in 2002 and only 7% in 1996. Shackleton (2011) comments that in the Netherlands 89% of pension fund assets have changed from internal to external management since 2002. A similar trend is observed in the occupational pension fund industry in the UK. Avrahampour (2007) reports that only 5 of the 50 largest occupational pension funds were internally managed in 2006, whereas there were 22 in 1981. This decline in internal management is matched by an increase of the number of companies hired as external managers. In 1981 a pension fund would hire at most 7 external managers whereas in 2006 there were funds hiring as many as 32 management firms.

Although the rise of external fund management is documented, it has not been studied in detail by fund performance literature. To the author’s knowledge the first work done on this is by Chen et al. (2006) who explicitly investigate the performance of outsourced US mutual funds. They find that externally managed funds significantly underperform those that are internally managed. This result is robust to different specifications including an adjustment for management fees. They also find that fund closure after a period of poor performance is more likely for outsourced funds.

Nonetheless, Cashman and Deli (2009) who also examine US mutual funds argue that outsourced or ‘sub-advised’ funds will outperform their internal counterparts if the investment style calls for ‘specific knowledge’. They draw this argument from Jensen and Meckling (1992) who define it as “knowledge that is costly to transfer among agents” and therefore “requires decentralising many decision rights in both the economy and in firms”. Cashman and Deli identify two categories of funds that may require ‘specific knowledge’.

The first category is funds that invest in international markets and, thus, require regional knowledge. The second category refers to domestic funds that invest in assets that are “harder to value”, e.g. they consider corporate bonds to be harder to value than government bonds. Similar to Chen et al. (2006) they find that outsourced funds underperform the internal ones. However, they show that when accounting for the need of specific knowledge, this underperformance is reduced.

Further work on US mutual funds by Duong (2010) contradicts the findings of Chen et al. as well as Cashman and Deli.[33] Duong finds no difference in the performance of external and internal funds. Moreover, no evidence is found that external funds are more likely to be closed following a period of poor performance. Still, external funds underperform internal funds in a subsample of companies that manage funds in-house and provide management services to other mutual funds. Duong argues that this underperformance is due to companies focusing more on the internal funds.

The above findings are inconsistent with what theory would suggest. In fact, Cashman and Deli (2009) point out that this could not exist in a truly competitive environment. It may be that fund performance can be affected by the managers’ personal characteristics (Golec, 1996; Chevalier and Ellison, 1997) or by the fund family characteristics (Massa, 2003; Chen et al., 2004). However, there is nothing to indicate that these types of characteristics differ on average between pension fund providers and external money management companies. Therefore, it is expected that there is no difference between the performance of internally managed funds and that of externally managed funds in the UK personal pension industry. Moreover, as a step further from the past research, it is also expected that the same factors explain fund performance independently of management type. This also applies to fund’s age, i.e. fund performance is expected to have a convex relationship with fund’s age for both internal and external funds. The rationale for the first case is that pension providers wish to attract potential policyholders and thus, their internal managers put in extra effort to make young funds perform as high as possible. As time goes by, the market has a better picture of these funds’ quality and the effort level gradually declines. The exact same argument applies for money management companies who instead of policyholders wish to attract other pension

[33] The samples of Chen et al. (2006) and Duong (2010) cover the period 1994-2004. The sample in Cashman and Deli (2009) covers the years 1998-2005.

providers. In this case, managers put in more effort for young funds to signal their managerial quality and skill to pension providers.

## 4.2. Methodology and descriptive analysis

This section has two parts. The first part, describes briefly the applied methodology. The second part starts with a documentation of how management outsourcing has developed in this industry. It continues with a descriptive analysis which compares the performance of internally managed funds to the performance of externally managed funds.

### 4.2.1. Methodology

The methodology applied in this chapter is the same as the one applied in Chapter 3. Fund performance is measured with the Sharpe ratio, the difference-in-returns and the M2 measures. The benchmark for all investment styles is each fund's PPB. Additionally, the performance of equity groups is measured against the FTSE All Shares index for comparison purposes. The distributions of the Sharpe ratio and the M2 measure have been winsorized by 0.5% in order to adjust for outliers. Finally, the frequency of observations is reduced from a monthly to a yearly panel using the average cumulative monthly returns formula.

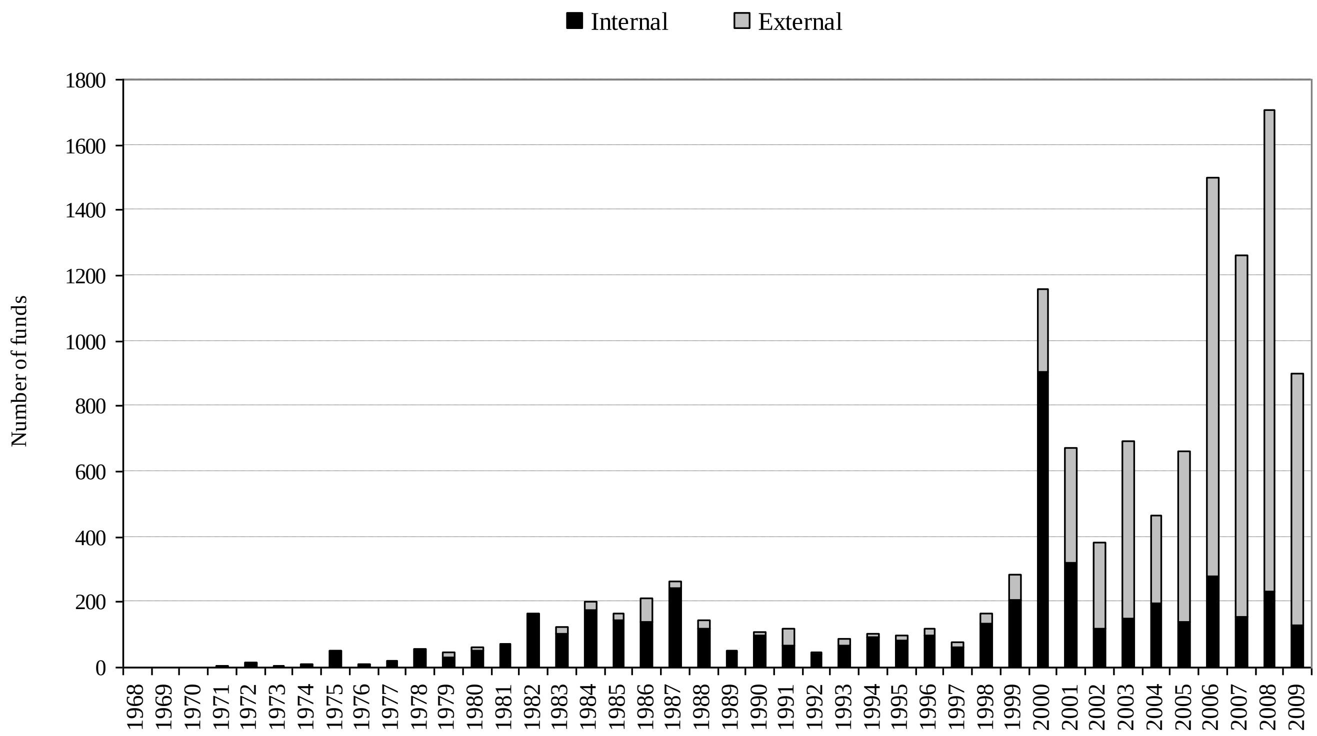
However, there is a very important difference from the methodology in the previous chapter. Here, each sample is separated into two subsamples according to the funds' management type. For example the equity sample is split into the internally managed equity funds subsample and the externally managed equity funds subsample. This way the properties of each can be studied in more detail. In particular, this allows the comparison of the factors that affect the performance of each subsample.

### 4.2.2. Descriptive analysis

In the Morningstar™ database, the name of pension funds that are externally managed starts with the form "name of company A" / "name of company B". The name of company A indicates who the provider is. The name of company B indicates the fund management firm. For example, a fund with name "Alico/BlackRock US Dynamic Pen" implies that the fund provider is the insurance company Alico and the fund portfolio is managed by the wealth management company BlackRock. This means that investors contribute to a pension fund bought from Alico and in turn Alico channels the contributions into a fund run by BlackRock. Investors will deal with the pension provider alone (i.e., Alico) and not with the underlying fund manager (i.e., BlackRock).

All externally managed funds in the sample have been identified by checking the name of each fund separately. From the total 12,307 funds available at the end of 2009, 5,040 are internally managed and 7,267 are externally managed. So the management of about 60% of all funds is outsourced. Figure 4.1 is a reproduction of Figure 2.6 where funds are sorted by management type. This figure shows that although a small number of funds had been outsourced through the 1960s-1990s, the proportion of outsourced funds has increased dramatically in the recent years. In more detail, in 1980 only 22 funds were managed externally. This number had increased to 235 by 1990 and then to 739 by 2000. By the end of 2009 it exploded to 7,267 funds. This is an increase of almost 900% within only nine years. Indeed, in 2000 almost 80% of the newly incepted funds were still internally managed. In 2001 approximately the same number of internally and externally managed new funds was opened. In 2005 more than 80% of newly opened funds were run externally. This trend continued in the following years up to the end of 2009 whereas internally managed funds continued opening at a rate similar to that before 2000. This clearly shows that providers have developed a strong preference for external management.

Figure 4.1. Number of internally and externally managed pension funds opened each year in the period 1968-2009. *Source: Own calculations using Morningstar Direct$^{TM}$ data.*




A more careful look at the data reveals that providers have also a clear preference for outsourcing particular investment styles. Table 4.1 shows the ratio of externally to internally managed funds for broad and narrow investment categories. In terms of broad investment style, equity and specialist funds are significantly more outsourced than the other types. Money market and protected funds are predominantly internally managed, while 20-30% of allocation and fixed income funds are externally managed. Real estate funds are equally distributed between internal and external management. The breakdown into narrow investment sectors shows a more distinct pattern. International investment types are significantly more outsourced than UK-focused funds for any asset class. This especially the case for emerging equity funds where over 90% of funds is externally managed.

Table 4.1. The number of internally and externally managed personal pension funds per investment sector. The last column is the ratio of the number of externally managed funds over the number of internally managed funds. Numbers refer to the entire sample. *Source: Own calculations using Morningstar Direct$^{TM}$ data.*

| | Number of internally managed funds (IN) | Number of externally managed funds (EX) | Ratio EX / IN |
|---|---|---|---|
| ***Broad investment sector*** | ***4715*** | ***7248*** | ***1.5*** |
| Allocation | 1215 | 1407 | 1.2 |
| Equity | 1963 | 4242 | 2.2 |
| Fixed income | 723 | 944 | 1.3 |
| Money market | 369 | 68 | 0.2 |
| Protected | 104 | 6 | 0.1 |
| Real estate | 211 | 210 | 1.0 |
| Specialist | 130 | 371 | 2.9 |
| ***Narrow investment sector*** | ***4112*** | ***6803*** | ***1.7*** |
| Allocation 100 | 169 | 387 | 2.3 |
| Allocation 85 | 389 | 449 | 1.2 |
| Allocation 60 | 200 | 464 | 2.3 |
| Allocation 35 | 62 | 9 | 0.1 |
| Equity emerging | 21 | 283 | 13.5 |
| Equity international | 1079 | 2183 | 2.0 |
| Equity UK | 658 | 1621 | 2.5 |
| Fixed income international | 49 | 116 | 2.4 |
| Fixed income UK | 582 | 803 | 1.4 |
| Real estate international | 22 | 101 | 4.6 |
| Real estate UK | 161 | 102 | 0.6 |

The above information makes clear that outsourcing has become the dominant type of management in the industry. This raises the question whether there is any empirical evidence to indicate that this is a beneficial development for policyholders in terms of performance. This is important since these pension funds are DC and the fund's performance may determine a high proportion of the policyholder's retirement income. The sample that is used for this purpose is the same as in Chapter 3, i.e., it includes a total of 4,909 funds and 28.586 observations. In this sample there are 3,571 equity, 320 allocation, and 705 fixed income funds. Table 4.2 shows the results of t-tests examining whether there are significant differences between internal and external funds for each sample. The variables tested are return, risk, and the Sharpe ratio of the fund and the PPB as well as the two performance measures relative to the PPB.

Table 4.2. Results of t-tests. Null hypothesis is that the difference in means is 0. The difference is calculated as internal minus external.

| Fund Type | Null Hypothesis | Variable | Mean | St. Error | t-statistic | p-value | Internal | | External | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Funds | Obs. | Funds | Obs. |
| All Funds | Difference in Means=0 | Fund Return | 0.045 | 0.021 | 2.095 | 0.0362 | 934 | 9810 | 3975 | 18776 |
| | | Fund Sigma | -0.849 | 0.029 | -29.007 | 0.0000 | | | | |
| | | Fund Sharpe | -0.045 | 0.005 | -8.589 | 0.0000 | | | | |
| | | PPB Return | 0.081 | 0.020 | 4.080 | 0.0000 | | | | |
| | | PPB Sigma | -0.779 | 0.029 | -26.716 | 0.0000 | | | | |
| | | PPB Sharpe | -0.021 | 0.005 | -4.505 | 0.0000 | | | | |
| | | $R_{Fund}$-$R_{PPB}$ | -0.036 | 0.010 | -3.648 | 0.0003 | | | | |
| | | M2 | -0.107 | 0.010 | -10.836 | 0.0000 | | | | |
| Allocation Funds | Difference in Means=0 | Fund Return | -0.049 | 0.096 | -0.506 | 0.6131 | 37 | 249 | 283 | 1330 |
| | | Fund Sigma | -0.185 | 0.120 | -1.540 | 0.1244 | | | | |
| | | Fund Sharpe | -0.007 | 0.025 | -0.290 | 0.7724 | | | | |
| | | PPB Return | 0.109 | 0.084 | 1.304 | 0.1930 | | | | |
| | | PPB Sigma | -0.202 | 0.177 | -1.142 | 0.2542 | | | | |
| | | PPB Sharpe | -0.013 | 0.022 | -0.589 | 0.5562 | | | | |
| | | $R_{Fund}$-$R_{PPB}$ | -0.158 | 0.074 | -2.137 | 0.0335 | | | | |
| | | M2 | -0.249 | 0.075 | -3.337 | 0.0010 | | | | |
| Fixed Income Funds | Difference in Means=0 | Fund Return | 0.131 | 0.029 | 4.468 | 0.0000 | 216 | 2314 | 489 | 2066 |
| | | Fund Sigma | -0.234 | 0.038 | -6.212 | 0.0000 | | | | |
| | | Fund Sharpe | 0.038 | 0.012 | 3.146 | 0.0017 | | | | |
| | | PPB Return | -0.027 | 0.024 | -1.093 | 0.2746 | | | | |
| | | PPB Sigma | -0.289 | 0.033 | -8.840 | 0.0000 | | | | |
| | | PPB Sharpe | -0.079 | 0.012 | -6.818 | 0.0000 | | | | |
| | | $R_{Fund}$-$R_{PPB}$ | 0.158 | 0.027 | 5.884 | 0.0000 | | | | |
| | | M2 | 0.153 | 0.023 | 6.691 | 0.0000 | | | | |
| Equity Funds | Difference in Means=0 | Fund Return | 0.022 | 0.028 | 0.761 | 0.4468 | 596 | 6443 | 2975 | 14629 |
| | | Fund Sigma | -0.344 | 0.031 | -11.052 | 0.0000 | | | | |
| | | Fund Sharpe | -0.020 | 0.005 | -3.751 | 0.0002 | | | | |
| | | PPB Return | 0.090 | 0.027 | 3.371 | 0.0008 | | | | |
| | | PPB Sigma | -0.336 | 0.032 | -10.635 | 0.0000 | | | | |
| | | PPB Sharpe | 0.001 | 0.005 | 0.200 | 0.8417 | | | | |
| | | $R_{Fund}$-$R_{PPB}$ | -0.068 | 0.012 | -5.886 | 0.0000 | | | | |
| | | M2 | -0.143 | 0.011 | -13.100 | 0.0000 | | | | |
| Emerging Equity Funds | Difference in Means=0 | Fund Return | -0.040 | 0.430 | -0.093 | 0.9261 | 5 | 48 | 178 | 666 |
| | | Fund Sigma | 0.147 | 0.375 | 0.392 | 0.6963 | | | | |
| | | Fund Sharpe | -0.060 | 0.059 | -1.022 | 0.3111 | | | | |
| | | PPB Return | -0.069 | 0.413 | -0.168 | 0.8670 | | | | |
| | | PPB Sigma | -0.306 | 0.376 | -0.814 | 0.4195 | | | | |
| | | PPB Sharpe | -0.040 | 0.059 | -0.678 | 0.5008 | | | | |
| | | $R_{Fund}$-$R_{PPB}$ | 0.029 | 0.062 | 0.471 | 0.6388 | | | | |
| | | M2 | -0.207 | 0.069 | -2.996 | 0.0036 | | | | |
| International Equity Funds | Difference in Means=0 | Fund Return | -0.010 | 0.037 | -0.262 | 0.7935 | 327 | 3634 | 1565 | 7977 |
| | | Fund Sigma | -0.304 | 0.043 | -7.155 | 0.0000 | | | | |
| | | Fund Sharpe | -0.019 | 0.007 | -2.827 | 0.0047 | | | | |
| | | PPB Return | 0.081 | 0.034 | 2.360 | 0.0183 | | | | |
| | | PPB Sigma | -0.206 | 0.043 | -4.828 | 0.0000 | | | | |
| | | PPB Sharpe | 0.006 | 0.006 | 1.036 | 0.3003 | | | | |
| | | $R_{Fund}$-$R_{PPB}$ | -0.091 | 0.015 | -5.887 | 0.0000 | | | | |
| | | M2 | -0.140 | 0.015 | -9.623 | 0.0000 | | | | |
| UK Equity Funds | Difference in Means=0 | Fund Return | 0.126 | 0.043 | 2.966 | 0.0030 | 264 | 2761 | 1232 | 5986 |
| | | Fund Sigma | -0.208 | 0.042 | -4.908 | 0.0000 | | | | |
| | | Fund Sharpe | -0.008 | 0.009 | -0.886 | 0.3754 | | | | |
| | | PPB Return | 0.174 | 0.041 | 4.259 | 0.0000 | | | | |
| | | PPB Sigma | -0.280 | 0.043 | -6.511 | 0.0000 | | | | |
| | | PPB Sharpe | 0.008 | 0.008 | 1.047 | 0.2949 | | | | |
| | | $R_{Fund}$-$R_{PPB}$ | -0.047 | 0.018 | -2.668 | 0.0077 | | | | |
| | | M2 | -0.141 | 0.017 | -8.492 | 0.0000 | | | | |

The results show that externally managed funds outperform their PPBs significantly more than internally managed funds. Moreover, the difference in the M2 measure is larger than that in the difference-in-returns measure. The fixed income funds are only exception where internal funds outperform external funds relative to the PPB. Indeed, the internal fixed income funds also have a significantly higher return whereas for almost all the other samples, the fund's return is not significantly different between internal and external funds.

Allocation and emerging equity funds stand out from the rest as there is practically no difference between internal and external funds and their PPBs. Still, the performance relative to the PPB is significantly different for these two samples. A reason for the allocation sample is that internal funds have smaller fund returns but higher PPB returns than external funds so that performance relative to the PPB is overall smaller for internal funds. For the emerging equity sample, one sees that internal funds have higher risk and their PPBs have lower risk than the corresponding variables of external funds. Although the differences are insignificant, they suffice to produce a significantly different risk-adjusted outperformance.

Generally, external funds have significantly higher risk but their PPBs are also riskier than those of the internal funds. At the same time, their PPBs have either lower or insignificantly different returns from the PPBs of internal funds. Thus, it appears that external managers have PPBs that are inefficient, i.e. their PPBs have low returns and high risk (relative to the PPBs of internal funds). This may suggest that the unequal performance is not due to differences in the fund but to differences in the PPB. This is corroborated by the funds' Sharpe ratios that differ very little when they are significant at all. This implies that external managers may choose more 'flattering' benchmarks.

## 4.3. Regression analysis

### 4.3.1. Explanatory variables and pairwise correlations

The frequency of the panel observations is yearly for all samples. The regression analysis adopted in this chapter is based on specifications (1) and (4) subject to several adjustments. Namely, it can be argued that the provider's size and experience may affect the choice of the external manager. For example, a large provider has the resources to find out who the best external manager is, same as an older provider has the experience to filter out the best managers. This choice may affect future fund performance. Therefore, it is deemed more appropriate to match the provider's characteristics to the corresponding 'provider'. Thus, for the internal samples the provider's characteristics are defined as follows:

- Provider's size ($Size_{i,t-1}$) is the first lag of the number of all internally managed funds within the same provider, measured in 100's of funds.
- Provider's market share ($Share_{i,t-1}$) in the fund's ABI sector is the first lag of the ratio of all internally managed funds with the same ABI sector within the same provider over the number of all internally managed funds with the same ABI operated by any provider, measured in per cent.
- ABI's share in the provider ($ABIshare_{i,t-1}$) is the first lag of the ratio of number of internal funds with the same ABI sector and the same provider over all internal funds that the provider operates, also measured in per cent.
- Provider's age is defined in the same way as in Chapter 3.

For the external samples, these definitions refer to the external management company, i.e.:

- Provider's size ($Size_{i,t-1}$) is the first lag of the number of all managed funds within the same wealth management company, measured in 100's of funds.
- Provider's market share ($Share_{i,t-1}$) in the fund's ABI sector is the first lag of the ratio of all managed funds with the same ABI sector within the same wealth management company over the number of all managed funds with the same ABI operated by any wealth management company, measured in per cent.

- ABI's share in the provider ($ABIshare_{i,t-1}$) is the first lag of the ratio of number of funds with the same ABI sector and the same wealth management company over all funds that this company operates, also measured in per cent.
- Provider's age is measured as the number of years elapsed at year-end since the inception date of the wealth management company's first fund in the market. Once more this variable is broken down into four dummies, each taking the value 1 if the management company is from 0 to 5, 5 to 10, 10 to 15, and 15 to 20 years old at year-end, i.e. $provider\ age_{i,t} = \{p0\_5_{i,t}, p5\_10_{i,t}, p10\_15_{i,t}, p15\_20_{i,t}\}$.

The pairwise correlations between the explanatory variables are shown in Tables 4.3.A-G for the internally managed funds and in Tables 4.4.A-G for the externally managed funds in Appendix L. In most cases the absolute values of the correlation coefficients do not exceed 0.56. Unsurprisingly, the correlation between the bear and bull market dummies is negative and around -0.5. The provider's characteristics are also correlated, particularly, for the internal sample.

Generally, collinearity between the explanatory variables doesn't seem to be an issue except for the internally managed emerging equity funds. This sample consists of only 5 funds with 48 observations as this style is mostly externally managed. As such, the regression of specification (4) produces very erratic results and is dropped from the analysis. The collinearity diagnostics that include the interaction terms are very similar to those reported in Table 3.4 and are not be shown here for brevity. Obviously, the only exception is the internally managed emerging equity sample where the condition number exceeds 300 and the determinant is very close to zero.

Summary statistics for the individual explanatory variables (excluding the interactive terms) for all samples are provided in Appendix M. The statistics for the internally managed funds are in the columns under 'Internal' and those for externally managed funds under 'External'.

4.3.2. Results with the PPB as benchmark

The regression analysis is done with fund fixed effects and the standard errors are calculated with the Hoechle (2007) method, i.e. they are corrected for heteroscedasticity, autocorrelation, and spatial correlation. Table 4.5 shows the results of specification (1) sorted by management type and then by sample.[34] Separating each sample according to the funds' management type doesn't make any difference for the significance of the Sharpe ratios. Neither the internal nor the external samples have statistically significant Sharpe ratios with the exception of the externally managed emerging equity funds (same as in Table 3.7).

However, there is a difference in the performance relative to the PPB. For internally managed funds the difference-in-return measure is very close to the M2 measure, which means that adjusting for risk doesn't change the result. The reason for this is that the difference between the fund's and the PPB's returns is proportionate to the difference between the fund's and the PPB's risk. On the other hand, the M2 measure is noticeably larger than the difference-in-returns for externally managed funds. For example, both the difference-in-returns and the M2 of the internally managed UK equity funds are circa 1.9%.[35] However, there is a considerable difference for external UK equity funds with their difference-in-returns at 2.55% and their M2 at 3.66%. This indicates that the difference between the fund's and the PPB's returns is larger than the difference between their risks. This corroborates the evidence in Table 4.2 which shows that external funds may have inefficient PPBs (low returns and high risk).

In terms of overall performance, internal management suits best fixed income funds. They have the highest outperformance among internal funds at around 3.6%. At the same time, fixed income funds that are externally managed are the only external group that has insignificant performance. Allocation funds are exactly the opposite, i.e. external management produces the best results for allocation funds whereas they are the only group among internal funds to have insignificant performance.

[34] The results of specification (1) for the internally managed emerging equity funds are shown as well but note that there is no corresponding analysis for specification (4).
[35] As a reminder, all effects on performance refer to annualised returns even though the analysis is carried out on average monthly cumulative returns.

Table 4.5. The estimated constant coefficient for specification (1), sorted by management type, sample and performance measure. The $R^2$-within is in all cases 0 and the F-test for the significance of the regression is not applicable. The benchmark is the PPB and the panel has the yearly structure. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

**Constant Coefficient**

| Sample | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Funds | Obs. |
|---|---|---|---|---|---|
| *Internally Managed* | | | | | |
| All Funds | **0.0082** | **0.1536*** ** | **0.1512*** ** | 934 | 9810 |
| | (0.879) | (0.000) | (0.000) | | |
| Allocation Funds | **0.0738** | **0.0715** | **0.0777** | 37 | 249 |
| | (0.445) | (0.636) | (0.560) | | |
| Fixed Income Funds | **0.0190** | **0.3279*** ** | **0.3316*** ** | 216 | 2314 |
| | (0.689) | (0.000) | (0.000) | | |
| Equity Funds | **0.0517** | **0.1216*** ** | **0.1245*** ** | 596 | 6443 |
| | (0.452) | (0.001) | (0.008) | | |
| Emerging Equity Funds | **0.1488** | **0.1361** ** | **0.0985** | 5 | 48 |
| | (0.115) | (0.023) | (0.231) | | |
| International Equity Funds | **0.0359** | **0.0913** ** | **0.0982* ** | 327 | 3634 |
| | (0.527) | (0.026) | (0.072) | | |
| UK Equity Funds | **0.0709** | **0.1612*** ** | **0.1595*** ** | 264 | 2761 |
| | (0.417) | (0.001) | (0.001) | | |
| *Externally Managed* | | | | | |
| All Funds | **0.0537** | **0.1900*** ** | **0.2583*** ** | 3975 | 18776 |
| | (0.528) | (0.000) | (0.001) | | |
| Allocation Funds | **0.0811** | **0.2298*** ** | **0.3266*** ** | 283 | 1330 |
| | (0.472) | (0.003) | (0.002) | | |
| Fixed Income Funds | **-0.0193** | **0.1703** | **0.1789** | 489 | 2066 |
| | (0.844) | (0.271) | (0.104) | | |
| Equity Funds | **0.0716** | **0.1896*** ** | **0.2671*** ** | 2975 | 14629 |
| | (0.410) | (0.000) | (0.000) | | |
| Emerging Equity Funds | **0.2089* ** | **0.1067* ** | **0.3059* ** | 178 | 666 |
| | (0.072) | (0.089) | (0.089) | | |
| International Equity Funds | **0.0550** | **0.1823*** ** | **0.2386*** ** | 1565 | 7977 |
| | (0.373) | (0.001) | (0.005) | | |
| UK Equity Funds | **0.0784** | **0.2086*** ** | **0.3008*** ** | 1232 | 5986 |
| | (0.517) | (0.000) | (0.000) | | |

Generally, although the Sharpe ratios of both management types are not significantly different from 0, externally managed funds perform better relative to their PPBs than internal funds. For example, in the all-funds sample the difference-in-returns is higher by 0.43% and the M2 by 12.7%. These are considerable differences in PPB outperformance, particularly when there is a risk-adjustment, which at least refutes the hypothesis that internal and external funds have the same performance relative to the PPB. However, there is an important point to be made on the PPB outperformance. The average Sharpe ratio is on average statistically not different from 0 but in most cases funds still manage to outperform their PPBs. This raises again the question on a PPB selection, i.e. how appropriate the chosen PPBs are for funds to measure their performance against. This may be more important for externally managed funds in view of the previous evidence that their PPBs have relatively low returns and high risk.

Tables 4.6.A-B show the results for the internal samples and Tables 4.7.A-B show the results of the external samples.[36] These regressions are carried out with the square root function of fund's age. The results with the other age functions are very consistent with these and are presented in Appendix N. Given that the explanatory power of the independent variables is different for the internal and the external funds the discussion distinguishes clearly between the results obtained for the two groups.

The significance of the constant term disappears from all the internal funds regressions except for those estimated for the fixed income funds. A quite different result is obtained for the external funds. Here some outperformance in comparison with PPBs is found for the equity, the UK equity and, to some weaker extent, for the international equity funds. In addition, some underperformance is obtained for the emerging equity, the fixed income and the allocation funds.

Consistently across the two groups the vast majority of the estimated coefficients for the Sharpe ratios are negative and significant during the bear markets. However, the Sharpe ratio of internal funds decreases by about 4.9 whereas that of external funds decreases by 7.4; that is a considerable difference of 2.5 on annualised terms. The internal funds do not perform worse than their benchmarks during the bear times, whereas, the externally managed international, emerging equity and equity funds significantly underperform their PPBs. This underperformance ranges from -3.66% for the M2 of all equity funds to -12.7% of emerging equity funds. In contrast, the externally managed allocation funds outperform their PPBs in bear years by 4.9% but this is only in nominal terms.

[36] Note that regressions with specification (4) have not been carried out for internally managed emerging equity funds due to the low number of observations and high correlation between the explanatory variables.

The performance during the bull markets is also very different for the internal and the external funds. The Sharpe ratio of all internal samples increases on average by around 4.9 whereas for external funds there is a significant increase of 3.6 only for the fixed income sample. Moreover, internal allocation and equity funds outperform their PPBs: the difference-in-returns increases by about 6.2% for equity funds and 12.7% for allocation funds whose M2 also increases by around 26.8%. At the same time, the allocation as well as international and UK equity funds show some underperformance with their M2 decreasing by around 3.6%. Only the external fixed income funds show outperformance during the bull years of 8.7% for the difference-in-returns and 6.17% for the M2. These results indicate that internal managers can cope better with changing market conditions whereas external managers have rather poor timing skills, i.e. fund performance is negatively affected in bear markets and there are no gains in bull markets.

The interactions between the market condition dummies and fund's age have also a different effect on the performance of the internal and the external funds. The interaction with the bear dummy is in most cases insignificant for the internally managed funds. It is positive only for the fixed income funds suggesting that older funds are less affected by a bear market. For example, using the specification with the logarithmic function, the average monthly M2 of a 5-year-old is 1.33% higher than that of a 1-year-old fund during a bear year. In contrast, the external equity, emerging and international equity funds have several positive coefficients for the interactive term suggesting that their bear market underperformance which was discussed earlier declines with fund's age.

There is also a visible difference between the coefficients estimated for the interactive term of the bull market dummy and fund's age. For the external funds only the fixed income funds have statistically significant coefficients. Their sign is negative suggesting that older funds underperform younger funds during bull years, e.g. the difference-in-returns of a 5-year-old fund is 7.4% lower than that of a 1-year-old fund (using the logarithmic function). Contrary, in the case of internal funds the fixed income ones are the only group without statistically significant coefficients. However, the relationship is the same, i.e. younger funds perform better under bull market conditions. Using again the logarithmic function and the difference-in-returns example, a 1-year-old internal equity fund outperforms the corresponding 5-year-old fund by about 2.4%.

The results for provider characteristics are not strong for either management type. In general, the provider's size seems to have a more positive effect on the performance of external funds whereas it is sometimes negative for the internal ones. For internal allocation funds all coefficients are insignificant. There is some significance for the M2 of internal fixed income and UK equity funds in the range of 3.6% and 2.4% for an extra 100 funds respectively but the difference-in-returns of international equity funds decreases by about 3.6%. However there is a significantly positive effect for all types of external funds except for UK equity. This effect is at its lowest for international equity with the difference-in-returns increasing by 1.2% and at its highest for emerging equity with an increase of about 4.9% with every additional 100 funds in size. These results are consistent with the hypothesis that external management companies can pool together the services they provide to their clients and realise economies of scale. This is corroborated by the results for the market share variable that has a positive effect on the external funds' Sharpe ratio (a small increase of 0.04 for an additional 1% in market share) whereas there is hardly any effect estimated for the internal funds.

Specialisation in an investment style seems beneficial for the performance of both management types with just one sample in each being positively affected. In particular, internal UK equity funds see their difference-in-returns and M2 increase by 0.36% and 0.24% respectively with every additional 1% in ABI's share whereas from the external samples there is a significant effect for the fixed income sample with corresponding increases of just 0.08% and 0.06%. Overall, the results for the provider's characteristics suggest that economies of scale are more important in the case of the external management companies. A possible explanation for this is that wealth management tends to be the only service these companies provide whereas the majority of pension fund providers have many different services such as pension, insurance, money management etc. and so the economies of scale are in a way already realised.

The age of provider does not seem to matter much for the internally managed funds. The U-shaped relationship observed in Chapter 3 appears only for the allocation funds with the 5-10 and 10-15 year-old providers significantly underperforming the others by an astounding 101% and 42% for the difference-in-returns and 79% and 60% for the M2 respectively. In contrast, there are some positive and statistically significant coefficients for the M2 of the international equity funds with the 10-15 year-old providers outperforming the others by about 8.7%, and in the case of UK equity funds an outperformance of about 4.9% is estimated for 15-20 year-old providers (significant at 10% only). However, given the patchy nature of these results it is hard to draw any firm conclusions.

Considerably stronger results have been obtained for the external funds. First, a U-shaped relationship between provider's age and performance is again observed for the allocation funds where 5 to 10 year-old providers have a significantly lower Sharpe ratio by around 4.9 and a lower difference-in-returns by about 11%. In the case of the international equity sample (and to a weaker extent the equity sample) the 0-15 year-old providers have significantly higher difference-in-returns from the 20+ group with the outperformance ranging between 11% and 4.9%. A very similar picture appears for fixed income funds with the 0-15 group outperforming by about 4.9%. So it would seem that the provider's age is more important for externally managed funds with younger providers delivering better performance than older providers. The only exception to this are external emerging equity funds where 0 to 10 year-old providers have a significantly lower M2 from the 20+ group by about 19%.

The interactions between fund's age and provider's age also show differences between the internal and external funds. In the case of the internal funds the vast majority of the significant coefficients are positive, whereas they are negative for the externally managed funds except for those estimated for the emerging equity funds (which are positive) and the UK equity funds (no significance). There is a tendency, both for the internal and the external funds, for the statistical significance to appear for the middle-age providers, although the significance of the coefficients estimated for the internally managed is much weaker (often only 10%) in comparison with the significance obtained for the externally managed funds. In short, it seems that in the case of the internally managed funds and the externally managed equity funds performance increases with fund's age for middle-age providers, and declines with fund's age for all other externally managed funds (but for the UK equity funds where no significance is found). Overall, the results for both management types indicate that at least one type of equity funds is subject to a catching up phase independent of management style (international equity).

The last interesting difference between the two management types concerns regulatory change. Although the performance of internally managed funds is practically unaffected by the introduction of either personal or stakeholder pensions, the performance of external funds has changed significantly. The difference-in-returns of the allocation funds and the Sharpe ratio of the UK equity funds have increased significantly after the introduction of personal pensions, the former by about 11% and the latter by 2.43. This is consistent with the hypothesis that the industry anticipates higher demand for these investment types and puts in more effort to increase performance in order to capitalise this demand. Still, performance relative to the PPB decreased for the external UK equity funds by approximately 5.2%.

The introduction of stakeholder schemes has had a positive effect on the performance of the allocation and the UK equity funds but a strong negative effect on international equity funds. In detail, the M2 of allocation funds increased by around 4.9% and the Sharpe ratio of UK equity funds by 3.6. This is consistent with the theory that there are fewer incentives to gather costly information on foreign markets when management fees are restricted. Overall, it seems that external management companies are more sensitive to regulatory change. Again, this may be due to money management being their sole business purpose and thus, they pay a lot more attention of developments that can change the industry. Most pension providers, on the other hand, have a diversified corporate strategy and react less strongly to new regulation that applies to only one part of their business.

Table 4.6.A. Results for the internally managed all-funds, allocation, fixed income, and equity samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | All-Funds | | | Allocation | | | Fixed Income | | | Equity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.0808** | **0.2399** | **0.1283** | **0.0162** | **-1.2212** | **-0.3144** | **0.2367** | **0.4331** | **0.5536*** ** | **0.0359** | **-0.1267** | **-0.2557** |
| | (0.485) | (0.520) | (0.677) | (0.979) | (0.456) | (0.862) | (0.260) | (0.271) | (0.006) | (0.708) | (0.761) | (0.488) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0377** | **-0.0343** | **0.0365** | **0.0626** | **0.9186** | **0.9159** | **-0.0161** | **-0.1088** | **-0.1281*** ** | **0.0528** | **0.0502** | **0.1726*** |
| | (0.568) | (0.673) | (0.690) | (0.682) | (0.147) | (0.156) | (0.877) | (0.105) | (0.002) | (0.345) | (0.566) | (0.092) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.3968*** ** | **-0.0010** | **-0.0108** | **-0.1795** | **0.8332** | **1.5795** | **-0.3884*** ** | **-0.6236** | **-0.1570** | **-0.3806*** ** | **0.2105** | **0.1084** |
| | (0.000) | (0.993) | (0.904) | (0.569) | (0.252) | (0.140) | (0.001) | (0.102) | (0.151) | (0.000) | (0.238) | (0.400) |
| $\boldsymbol{Bull_{i,t}}$ | **0.3346*** ** | **0.2538*** | **0.1233** | **0.5421** ** | **1.4934*** | **2.1681*** | **0.3244*** ** | **-0.0115** | **-0.0448** | **0.3275*** ** | **0.4612** ** | **0.1858** |
| | (0.000) | (0.093) | (0.336) | (0.034) | (0.080) | (0.083) | (0.004) | (0.928) | (0.634) | (0.000) | (0.019) | (0.234) |
| $\boldsymbol{Size_{i,t-1}}$ | **-0.1661*** ** | **-0.0609** | **-0.0005** | **0.3752** | **1.5954*** | **1.7816** | **-0.1126** | **0.1491** | **0.1927** | **-0.0420** | **-0.1143** | **-0.0298** |
| | (0.005) | (0.380) | (0.994) | (0.564) | (0.078) | (0.334) | (0.182) | (0.341) | (0.137) | (0.225) | (0.255) | (0.665) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0002** | **-0.0001** | **-0.0010** | **-0.0128** | **-0.0631** | **-0.1064** | **0.0005** | **-0.0084** ** | **-0.0055** | **0.0003** | **0.0054** | **-0.0005** |
| | (0.890) | (0.959) | (0.779) | (0.744) | (0.143) | (0.148) | (0.890) | (0.049) | (0.418) | (0.842) | (0.211) | (0.885) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0040** | **0.0132** ** | **0.0095*** | **-0.0239** | **-0.0662** | **-0.1394** | **-0.0049** | **0.0292** | **0.0009** | **-0.0006** | **0.0228*** ** | **0.0187*** ** |
| | (0.369) | (0.036) | (0.066) | (0.525) | (0.573) | (0.122) | (0.554) | (0.230) | (0.941) | (0.904) | (0.002) | (0.004) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.0232** | **-0.1748** | **0.2291** | **-0.5201** | **1.1741** | **0.6476** | **-0.2980** | **0.1305** | **-0.4603** | **0.1166** | **-0.2469** | **0.6730** |
| | (0.918) | (0.754) | (0.627) | (0.439) | (0.508) | (0.747) | (0.481) | (0.841) | (0.608) | (0.498) | (0.692) | (0.207) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.0446** | **-0.1752** | **-0.1675** | **-3.2852** ** | **-6.0690*** | **-4.7621*** | **-0.0585** | **0.2108** | **-0.2215** | **-0.0308** | **-0.1728** | **0.2188** |
| | (0.809) | (0.652) | (0.604) | (0.024) | (0.089) | (0.086) | (0.846) | (0.565) | (0.202) | (0.830) | (0.711) | (0.578) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.0720** | **-0.2104** | **0.0964** | **-1.8538*** ** | **-2.9436** ** | **-3.7024*** ** | **-0.2131** | **0.0100** | **-0.1764** | **-0.0625** | **-0.1913** | **0.3729** |
| | (0.607) | (0.323) | (0.660) | (0.002) | (0.012) | (0.005) | (0.230) | (0.971) | (0.299) | (0.592) | (0.413) | (0.125) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.0512** | **-0.1751** | **-0.0508** | **-0.4040** | **0.5570** | **-0.3788** | **-0.1655** | **0.0404** | **0.0131** | **-0.0320** | **-0.1869** | **0.1424** |
| | (0.559) | (0.253) | (0.720) | (0.393) | (0.572) | (0.717) | (0.320) | (0.649) | (0.881) | (0.588) | (0.244) | (0.303) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.0241** | **0.1516** | **-0.0351** | **0.2732** | **-0.1063** | **-0.0819** | **0.0929** | **-0.0546** | **0.2783** | **-0.0342** | **0.2255** | **-0.1868** |
| | (0.814) | (0.600) | (0.881) | (0.407) | (0.864) | (0.927) | (0.593) | (0.860) | (0.555) | (0.687) | (0.522) | (0.529) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **0.0220** | **0.0213** | **0.0361** | **1.3564** ** | **2.4137*** | **1.8494*** | **-0.0222** | **-0.1260** | **0.0526** | **0.0129** | **0.0127** | **-0.1004** |
| | (0.722) | (0.868) | (0.733) | (0.019) | (0.050) | (0.093) | (0.821) | (0.320) | (0.378) | (0.797) | (0.935) | (0.475) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **0.0387** | **0.0756** | **-0.0178** | **0.4403*** ** | **0.5704*** | **0.7758** ** | **0.0562** | **0.0336** | **0.0761** | **0.0253** | **0.0549** | **-0.0981** |
| | (0.345) | (0.199) | (0.749) | (0.004) | (0.082) | (0.022) | (0.252) | (0.656) | (0.152) | (0.494) | (0.341) | (0.123) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **0.0233** | **0.0593** | **0.0180** | **0.1265** | **-0.2095** | **0.0367** | **0.0378** | **-0.0104** | **-0.0115** | **0.0106** | **0.0674*** | **-0.0210** |
| | (0.351) | (0.125) | (0.610) | (0.332) | (0.454) | (0.884) | (0.389) | (0.626) | (0.675) | (0.535) | (0.080) | (0.549) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **0.0314** ** | **0.0192** | **0.0037** | **-0.0505** | **-0.6003*** | **-0.4459** | **0.0238** | **-0.0311** | **-0.0435** | **0.0077** | **0.0348*** | **0.0135** |
| | (0.033) | (0.188) | (0.774) | (0.749) | (0.057) | (0.317) | (0.205) | (0.377) | (0.101) | (0.246) | (0.084) | (0.321) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **-0.0096** | **0.0392** | **0.0255** | **-0.1214** | **-0.0269** | **-0.2800** | **0.0671** ** | **0.1672** ** | **0.0759*** ** | **-0.0289** | **-0.0226** | **-0.0122** |
| | (0.613) | (0.236) | (0.428) | (0.210) | (0.927) | (0.420) | (0.011) | (0.022) | (0.005) | (0.107) | (0.640) | (0.796) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **-0.0642*** ** | **-0.0507** | **-0.0467** | **-0.1863** ** | **-0.2858** | **-0.5392** | **-0.0313** | **-0.0044** | **-0.0058** | **-0.0626*** ** | **-0.1061** ** | **-0.0807** ** |
| | (0.001) | (0.173) | (0.128) | (0.018) | (0.372) | (0.159) | (0.187) | (0.853) | (0.780) | (0.000) | (0.021) | (0.033) |
| $\boldsymbol{PPP_t}$ | **-0.0996** | **-0.1583** | **-0.1760** | | | | **-0.1120** | **0.0724** | **0.1545** | **-0.0674** | **-0.1761** | **-0.2707** |
| | (0.232) | (0.587) | (0.370) | | | | (0.410) | (0.821) | (0.186) | (0.431) | (0.574) | (0.351) |
| $\boldsymbol{STK_t}$ | **-0.0166** | **-0.0051** | **-0.0189** | **0.0070** | **-0.4710** | **-1.1778** | **-0.0631** | **0.0381** | **0.0669** | **-0.0063** | **-0.0730** | **-0.1030** |
| | (0.855) | (0.949) | (0.826) | (0.976) | (0.425) | (0.132) | (0.709) | (0.598) | (0.345) | (0.931) | (0.435) | (0.412) |
| $R^2$ within | 0.3173 | 0.0131 | 0.0093 | 0.4520 | 0.1217 | 0.1597 | 0.1856 | 0.0689 | 0.0666 | 0.5109 | 0.0238 | 0.0299 |
| F-statistic | 59.2430 | 7.6276 | 17.0910 | 3019.5332 | 276.1224 | 1485.7434 | 68.0058 | 25.8212 | 32.0601 | 131.8935 | 6.7207 | 12.1799 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 933 | 933 | 933 | 37 | 37 | 37 | 216 | 216 | 216 | 596 | 596 | 596 |
| Observations | 9756 | 9756 | 9756 | 248 | 248 | 248 | 2296 | 2296 | 2296 | 6417 | 6417 | 6417 |

Table 4.6.B. Results for the internally managed equity sub-samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sub-sample | International | | | UK | | |
|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.0008** | **-0.2475** | **-0.1304** | **0.0904** | **-0.2378** | **-0.4470** |
| | (0.995) | (0.588) | (0.668) | (0.455) | (0.693) | (0.416) |
| $f(age_{i,t})$ | **0.0839** | **0.0258** | **0.1455** | **0.0036** | **0.0720** | **0.2084** |
| | (0.110) | (0.786) | (0.143) | (0.955) | (0.547) | (0.127) |
| $Bear_{i,t}$ | **-0.3187*** ** | **0.2123** | **0.0617** | **-0.5079*** ** | **0.2446** | **0.1509** |
| | (0.002) | (0.334) | (0.708) | (0.000) | (0.188) | (0.382) |
| $Bull_{i,t}$ | **0.3638*** ** | **0.3594* ** | **0.0837** | **0.2768*** ** | **0.5900* ** | **0.2946** |
| | (0.000) | (0.077) | (0.499) | (0.002) | (0.070) | (0.286) |
| $Size_{i,t-1}$ | **-0.0311** | **-0.2666* ** | **-0.1433** | **-0.0548** | **0.0819** | **0.1463** |
| | (0.393) | (0.080) | (0.119) | (0.237) | (0.363) | (0.110) |
| $Share_{i,t-1}$ | **-0.0013** | **0.0425** ** | **0.0159** | **0.0016** | **0.0016** | **-0.0004** |
| | (0.754) | (0.022) | (0.184) | (0.272) | (0.799) | (0.936) |
| $ABIshare_{i,t-1}$ | **0.0011** | **0.0025** | **0.0131** | **-0.0062** | **0.0319*** ** | **0.0207*** ** |
| | (0.810) | (0.884) | (0.348) | (0.390) | (0.003) | (0.009) |
| $p0\_5_{i,t}$ | **0.2294** | **0.0757** | **1.2247** | **-0.0383** | **-0.5592** | **-0.0929** |
| | (0.301) | (0.924) | (0.102) | (0.864) | (0.534) | (0.909) |
| $p5\_10_{i,t}$ | **0.0806** | **0.2016** | **0.6141** | **-0.1009** | **-0.4223** | **-0.1471** |
| | (0.634) | (0.735) | (0.191) | (0.517) | (0.338) | (0.706) |
| $p10\_15_{i,t}$ | **0.0373** | **0.0141** | **0.7227** ** | **-0.1566** | **-0.3380** | **-0.0078** |
| | (0.818) | (0.970) | (0.038) | (0.212) | (0.176) | (0.977) |
| $p15\_20_{i,t}$ | **0.0299** | **-0.3689** | **-0.0305** | **-0.1071** | **0.0266** | **0.3171* ** |
| | (0.748) | (0.177) | (0.880) | (0.195) | (0.870) | (0.094) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **-0.1083** | **-0.0473** | **-0.6054** | **0.0873** | **0.4726** | **0.3233** |
| | (0.401) | (0.914) | (0.157) | (0.470) | (0.351) | (0.463) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **-0.0241** | **-0.0866** | **-0.2242** | **0.0444** | **0.0269** | **-0.0153** |
| | (0.676) | (0.677) | (0.190) | (0.382) | (0.838) | (0.904) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.0190** | **-0.0213** | **-0.2355** ** | **0.0796** ** | **0.1123* ** | **0.0414** |
| | (0.722) | (0.835) | (0.018) | (0.016) | (0.050) | (0.493) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0153** | **0.1176* ** | **0.0180** | **0.0488* ** | **0.0031** | **-0.0688** |
| | (0.518) | (0.057) | (0.711) | (0.053) | (0.926) | (0.108) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0068** | **0.0681** ** | **0.0385** ** | **0.0069** | **-0.0067** | **-0.0247** |
| | (0.365) | (0.029) | (0.043) | (0.365) | (0.704) | (0.152) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **-0.0170** | **-0.0361** | **-0.0362** | **-0.0388** ** | **-0.0133** | **0.0256** |
| | (0.399) | (0.526) | (0.447) | (0.039) | (0.805) | (0.665) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0649*** ** | **-0.0973* ** | **-0.0772* ** | **-0.0596** ** | **-0.1135** | **-0.0778** |
| | (0.003) | (0.070) | (0.051) | (0.015) | (0.109) | (0.190) |
| $PPP_t$ | **-0.1282** | **0.0943** | **-0.2318** | **0.0487** | **-0.4042** | **-0.3768** |
| | (0.155) | (0.742) | (0.379) | (0.643) | (0.329) | (0.303) |
| $STK_t$ | **-0.1004** | **-0.0734** | **-0.0866** | **0.1813** | **-0.1201** | **-0.1611** |
| | (0.170) | (0.476) | (0.456) | (0.104) | (0.494) | (0.356) |
| $R^2$ within | 0.4464 | 0.0239 | 0.0403 | 0.6337 | 0.0538 | 0.0547 |
| F-statistic | 186.8956 | 6.3520 | 17.3021 | 128.0717 | 25.5550 | 130.0020 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 327 | 327 | 327 | 264 | 264 | 264 |
| Observations | 3623 | 3623 | 3623 | 2746 | 2746 | 2746 |

Table 4.7.A. Results for the externally managed all-funds, allocation, fixed income, and equity samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | All-Funds | | | Allocation | | | Fixed Income | | | Equity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.0202** | **-0.3242** | **0.3569** | **0.3355** | **-1.5625**** | **-0.8271** | **-0.9683**** | **-1.6473** | **-1.1413** | **0.1576** | **-0.0051** | **0.6508**** |
| | (0.910) | (0.374) | (0.278) | (0.484) | (0.023) | (0.202) | (0.013) | (0.231) | (0.301) | (0.241) | (0.981) | (0.016) |
| $f(age_{i,t})$ | **0.0682** | **0.2504** | **0.2388** | **-0.0208** | **0.0750** | **0.1553** | **0.2659** | **0.5294** | **0.3735** | **-0.0008** | **0.1845*** | **0.2045** |
| | (0.496) | (0.121) | (0.160) | (0.872) | (0.776) | (0.459) | (0.274) | (0.159) | (0.239) | (0.988) | (0.073) | (0.108) |
| $Bear_{i,t}$ | **-0.6174***** | **-0.0927** | **-0.1744** | **-0.7677***** | **0.4374**** | **-0.2130** | **-0.4279***** | **-0.2751** | **0.1380** | **-0.7230***** | **-0.2719***** | **-0.2798*** |
| | (0.000) | (0.172) | (0.176) | (0.000) | (0.022) | (0.149) | (0.001) | (0.491) | (0.587) | (0.000) | (0.001) | (0.057) |
| $Bull_{i,t}$ | **0.0496** | **0.0874** | **-0.1523** | **-0.0598** | **0.4984** | **-0.3413*** | **0.2663***** | **0.7173**** | **0.5108**** | **-0.0675** | **-0.1420** | **-0.3132*** |
| | (0.491) | (0.556) | (0.354) | (0.626) | (0.164) | (0.068) | (0.005) | (0.030) | (0.045) | (0.287) | (0.102) | (0.062) |
| $Size_{i,t-1}$ | **0.0337** | **0.1145** | **0.0378** | **-0.0554** | **0.4019** | **0.0480** | **0.1640** | **0.4055*** | **0.3065** | **0.0010** | **-0.0134** | **-0.0523** |
| | (0.570) | (0.101) | (0.689) | (0.809) | (0.241) | (0.882) | (0.443) | (0.066) | (0.220) | (0.985) | (0.869) | (0.601) |
| $Share_{i,t-1}$ | **0.0023**** | **0.0022** | **0.0012** | **0.0034** | **0.0038** | **0.0017** | **0.0068**** | **0.0029** | **0.0005** | **0.0013** | **0.0028** | **0.0029** |
| | (0.031) | (0.513) | (0.728) | (0.592) | (0.740) | (0.855) | (0.041) | (0.610) | (0.912) | (0.466) | (0.634) | (0.598) |
| $ABIshare_{i,t-1}$ | **0.0005** | **0.0035** | **0.0015** | **0.0025** | **0.0095** | **0.0066** | **0.0027** | **0.0071***** | **0.0054**** | **-0.0002** | **0.0027** | **0.0010** |
| | (0.524) | (0.233) | (0.404) | (0.190) | (0.115) | (0.126) | (0.126) | (0.005) | (0.033) | (0.784) | (0.411) | (0.675) |
| $p0\_5_{i,t}$ | **0.1167** | **0.2918** | **-0.0288** | **-0.3135** | **-0.4348** | **0.1828** | **0.6375** | **1.2146** | **0.0811** | **0.0758** | **0.3326** | **0.0068** |
| | (0.564) | (0.398) | (0.918) | (0.503) | (0.492) | (0.818) | (0.325) | (0.433) | (0.953) | (0.509) | (0.149) | (0.976) |
| $p5\_10_{i,t}$ | **0.1569** | **0.3822** | **0.2354** | **-0.3614*** | **-0.8722*** | **-0.1593** | **0.8224***** | **0.6941** | **0.9970** | **0.0857** | **0.4845**** | **0.2157** |
| | (0.139) | (0.214) | (0.284) | (0.095) | (0.058) | (0.743) | (0.003) | (0.451) | (0.245) | (0.161) | (0.017) | (0.128) |
| $p10\_15_{i,t}$ | **0.2367**** | **0.4514** | **0.2624** | **0.1531** | **-0.0571** | **0.4265** | **0.4193*** | **0.2996** | **0.6788** | **0.1246*** | **0.3754**** | **0.1370** |
| | (0.047) | (0.126) | (0.251) | (0.453) | (0.874) | (0.264) | (0.078) | (0.557) | (0.255) | (0.057) | (0.048) | (0.253) |
| $p15\_20_{i,t}$ | **0.1691** | **0.2535** | **0.1953** | **0.2156** | **0.4481** | **0.4539** | **0.3692**** | **0.3889** | **0.5038** | **0.0999*** | **0.1300** | **0.0732** |
| | (0.103) | (0.189) | (0.231) | (0.385) | (0.267) | (0.109) | (0.028) | (0.486) | (0.269) | (0.090) | (0.271) | (0.273) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.0318** | **-0.0581** | **0.0471** | **0.1128** | **0.3135** | **0.1148** | **-0.0765** | **-0.1787** | **0.2780** | **0.0108** | **-0.1187** | **-0.0146** |
| | (0.504) | (0.557) | (0.644) | (0.403) | (0.222) | (0.785) | (0.749) | (0.681) | (0.581) | (0.821) | (0.191) | (0.861) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **-0.0163** | **-0.1438*** | **-0.1052** | **0.0548** | **0.2495** | **0.0206** | **-0.2423***** | **-0.1259** | **-0.3512*** | **0.0027** | **-0.1817**** | **-0.0966** |
| | (0.447) | (0.096) | (0.220) | (0.239) | (0.187) | (0.885) | (0.005) | (0.233) | (0.068) | (0.896) | (0.018) | (0.136) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.0375** | **-0.1501*** | **-0.1136** | **-0.0696*** | **-0.0573** | **-0.1914*** | **-0.0353** | **-0.0318** | **-0.2017** | **-0.0096** | **-0.1132** | **-0.0697** |
| | (0.230) | (0.094) | (0.158) | (0.081) | (0.594) | (0.060) | (0.616) | (0.663) | (0.120) | (0.663) | (0.167) | (0.240) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0249** | **-0.0585** | **-0.0653** | **-0.0591** | **-0.1167** | **-0.1483*** | **-0.1083**** | **-0.1372** | **-0.1928**** | **-0.0109** | **-0.0146** | **-0.0259** |
| | (0.429) | (0.264) | (0.222) | (0.277) | (0.240) | (0.053) | (0.047) | (0.173) | (0.046) | (0.644) | (0.731) | (0.497) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0003** | **-0.0456***** | **-0.0179** | **0.0181** | **-0.0778** | **-0.0146** | **-0.0215** | **-0.1579***** | **-0.1058** | **0.0041** | **-0.0153** | **0.0020** |
| | (0.987) | (0.007) | (0.464) | (0.733) | (0.328) | (0.832) | (0.679) | (0.010) | (0.119) | (0.757) | (0.343) | (0.933) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0151** | **0.0486** | **0.0290** | **0.0173** | **-0.1390** | **-0.0483** | **0.0497** | **0.2830** | **0.0813** | **0.0403*** | **0.0824**** | **0.0457** |
| | (0.590) | (0.146) | (0.513) | (0.496) | (0.109) | (0.389) | (0.227) | (0.126) | (0.445) | (0.093) | (0.027) | (0.387) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0118** | **-0.0221** | **-0.0400** | **-0.0028** | **-0.1426** | **0.0068** | **-0.1278**** | **-0.3875***** | **-0.3176***** | **0.0295** | **0.0512** | **0.0014** |
| | (0.698) | (0.641) | (0.486) | (0.934) | (0.168) | (0.920) | (0.013) | (0.005) | (0.003) | (0.186) | (0.141) | (0.982) |
| $PPP_t$ | **-0.0974** | **0.0278** | **-0.3167*** | **-0.1368** | **0.9264***** | **0.5481** | **-0.0760** | **0.1136** | **0.0886** | **-0.0433** | **0.0251** | **-0.3834**** |
| | (0.316) | (0.885) | (0.083) | (0.496) | (0.009) | (0.217) | (0.698) | (0.811) | (0.808) | (0.595) | (0.891) | (0.040) |
| $STK_t$ | **0.0032** | **-0.2527*** | **-0.2181** | **0.1619** | **0.2170** | **0.3936**** | **0.0182** | **0.1730** | **0.1067** | **0.0471** | **-0.2768**** | **-0.2380** |
| | (0.972) | (0.074) | (0.209) | (0.109) | (0.208) | (0.014) | (0.929) | (0.286) | (0.574) | (0.576) | (0.016) | (0.138) |
| $R^2$ within | 0.4638 | 0.0091 | 0.0404 | 0.5568 | 0.1034 | 0.1588 | 0.1425 | 0.0523 | 0.0601 | 0.5710 | 0.0146 | 0.0584 |
| F-statistic | 2425.0234 | 57.0138 | 177.9827 | 12511.3493 | 118.5539 | 90.9409 | 337.8373 | 78.6786 | 148.4566 | 1058.3670 | 192.6224 | 97.2463 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 3964 | 3964 | 3964 | 283 | 283 | 283 | 489 | 489 | 489 | 2975 | 2975 | 2975 |
| Observations | 18624 | 18624 | 18624 | 1316 | 1316 | 1316 | 2055 | 2055 | 2055 | 14557 | 14557 | 14557 |

Table 4.7.B. Results for the externally managed equity sub-samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sub-sample | | Emerging | | | International | | | UK | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.1123** | **-1.2653**** | **0.4369** | **0.1327** | **-0.3368** | **0.6677** | **-0.1320** | **0.7785*** | **0.8464**** |
| | (0.696) | (0.038) | (0.472) | (0.431) | (0.440) | (0.104) | (0.468) | (0.067) | (0.024) |
| $f(age_{i,t})$ | **0.1467** | **0.5013**** | **0.1278** | **0.0400** | **0.2773**** | **0.2101*** | **-0.0373** | **0.0233** | **0.1726** |
| | (0.180) | (0.047) | (0.623) | (0.483) | (0.029) | (0.089) | (0.566) | (0.864) | (0.265) |
| $Bear_{i,t}$ | **-0.9538***** | **-0.4213**** | **-1.0256***** | **-0.5691***** | **-0.4808***** | **-0.5541***** | **-0.7801***** | **-0.0279** | **0.0661** |
| | (0.000) | (0.016) | (0.000) | (0.000) | (0.001) | (0.000) | (0.000) | (0.678) | (0.790) |
| $Bull_{i,t}$ | **0.1180** | **0.6587** | **-0.0946** | **0.0155** | **-0.1293**** | **-0.3029***** | **-0.1058** | **-0.2352*** | **-0.3695*** |
| | (0.163) | (0.150) | (0.831) | (0.799) | (0.044) | (0.004) | (0.140) | (0.071) | (0.093) |
| $Size_{i,t-1}$ | **0.0415** | **0.4493**** | **0.3175** | **0.0521** | **0.0384** | **0.0077** | **-0.0459** | **-0.0725** | **-0.1577** |
| | (0.772) | (0.042) | (0.196) | (0.401) | (0.679) | (0.930) | (0.691) | (0.722) | (0.375) |
| $Share_{i,t-1}$ | **0.0033** | **-0.0137** | **-0.0033** | **-0.0013** | **0.0018** | **-0.0027** | **0.0070**** | **0.0102** | **0.0180**** |
| | (0.603) | (0.343) | (0.817) | (0.606) | (0.821) | (0.753) | (0.015) | (0.344) | (0.044) |
| $ABIshare_{i,t-1}$ | **-0.0008** | **0.0092** | **0.0011** | **-0.0001** | **0.0015** | **-0.0009** | **-0.0007** | **0.0017** | **-0.0008** |
| | (0.844) | (0.360) | (0.916) | (0.918) | (0.728) | (0.789) | (0.582) | (0.394) | (0.753) |
| $p0\_5_{i,t}$ | **0.1536** | **-0.4620** | **-1.9666**** | **0.1327** | **0.8861***** | **0.2700** | **-0.0077** | **-0.4141** | **-0.2552** |
| | (0.508) | (0.525) | (0.026) | (0.225) | (0.007) | (0.451) | (0.967) | (0.248) | (0.352) |
| $p5\_10_{i,t}$ | **0.2152** | **0.7213** | **-1.3260** | **0.1444*** | **0.6175***** | **0.3286** | **-0.0148** | **0.1560** | **0.0530** |
| | (0.335) | (0.198) | (0.101) | (0.100) | (0.010) | (0.108) | (0.871) | (0.512) | (0.717) |
| $p10\_15_{i,t}$ | **0.2257** | **1.0307**** | **-0.0961** | **0.1637***** | **0.3937**** | **0.1244** | **0.0375** | **0.2460** | **0.1001** |
| | (0.220) | (0.018) | (0.885) | (0.006) | (0.036) | (0.465) | (0.757) | (0.428) | (0.695) |
| $p15\_20_{i,t}$ | **-0.0010** | **0.3762** | **-0.7951*** | **0.1793***** | **0.3290**** | **0.1961**** | **-0.0055** | **-0.1015** | **0.0582** |
| | (0.993) | (0.139) | (0.079) | (0.002) | (0.033) | (0.038) | (0.962) | (0.517) | (0.635) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.0169** | **0.1690** | **0.7487***** | **-0.0112** | **-0.3429**** | **-0.1133** | **0.0376** | **0.1175** | **0.0101** |
| | (0.791) | (0.550) | (0.000) | (0.791) | (0.015) | (0.399) | (0.618) | (0.568) | (0.956) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0534** | **-0.2651** | **0.5147**** | **-0.0129** | **-0.1599**** | **-0.0789** | **0.0294** | **-0.1865** | **-0.1549** |
| | (0.400) | (0.427) | (0.026) | (0.620) | (0.036) | (0.251) | (0.384) | (0.169) | (0.181) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.0066** | **-0.2185*** | **0.0203** | **-0.0233** | **-0.0809** | **-0.0189** | **0.0237** | **-0.1452** | **-0.1333** |
| | (0.909) | (0.089) | (0.914) | (0.201) | (0.103) | (0.703) | (0.560) | (0.390) | (0.356) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **0.0579** | **0.0331** | **0.3618***** | **-0.0252** | **-0.0388** | **-0.0284** | **0.0023** | **-0.0042** | **-0.0715** |
| | (0.137) | (0.527) | (0.004) | (0.125) | (0.404) | (0.490) | (0.950) | (0.948) | (0.268) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0275** | **-0.1423***** | **-0.0392** | **-0.0025** | **-0.0100** | **0.0098** | **0.0055** | **-0.0252** | **-0.0021** |
| | (0.448) | (0.010) | (0.642) | (0.837) | (0.600) | (0.658) | (0.849) | (0.598) | (0.963) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0768** | **0.2097***** | **0.2547**** | **0.0358** | **0.1080*** | **0.0783** | **-0.0102** | **0.0540*** | **0.0174** |
| | (0.137) | (0.005) | (0.031) | (0.135) | (0.052) | (0.191) | (0.742) | (0.097) | (0.779) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0153** | **-0.1290** | **-0.0203** | **0.0317** | **0.0651** | **0.0072** | **-0.0048** | **0.0542*** | **0.0144** |
| | (0.729) | (0.324) | (0.869) | (0.106) | (0.153) | (0.893) | (0.897) | (0.096) | (0.817) |
| $PPP_t$ | | | | **-0.1240** | **0.2203** | **-0.3648** | **0.2286*** | **-0.5146**** | **-0.5657**** |
| | | | | (0.256) | (0.422) | (0.156) | (0.052) | (0.032) | (0.043) |
| $STK_t$ | **-0.0411** | **-0.1783** | **-0.2491** | **-0.0998** | **-0.5274***** | **-0.4261***** | **0.3184***** | **0.0918** | **0.0366** |
| | (0.790) | (0.597) | (0.627) | (0.359) | (0.010) | (0.004) | (0.001) | (0.778) | (0.897) |
| $R^2$ within | 0.8191 | 0.1402 | 0.3123 | 0.5170 | 0.0552 | 0.1052 | 0.6545 | 0.0327 | 0.0933 |
| F-statistic | 22628.7865 | 1139.1968 | 472.0970 | 2058.6334 | 116.2377 | 227.2697 | 7064.8634 | 219.9436 | 117.6680 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 178 | 178 | 178 | 1565 | 1565 | 1565 | 1232 | 1232 | 1232 |
| Observations | 664 | 664 | 664 | 7938 | 7938 | 7938 | 5955 | 5955 | 5955 |

### 4.3.3. Performance with the FTSE All Shares index as benchmark

This section examines the performance of equity funds relative to the FTSE All Shares index. As in Chapter 3, this is carried out as a comparison to the results with the PPB as benchmark. For a start, externally managed funds outperform the FTSE All Shares index more than internal funds. Table 4.8 shows the estimation results for specification (1) and in all the cases the coefficients for the externally managed samples are larger than their internal equivalents. The internal and the external emerging equity funds outperform the FTSE All Shares index far more than the international and the UK equity funds do. The international equity funds do not outperform the index irrespective of their management type. The only indication otherwise is the difference-in-returns of the externally managed funds that is statistically significant at the 10% level.

Table 4.8. The estimated constant coefficient for specification (1), sorted by management type, sample and performance measure. The $R^2$-within is in all cases 0 and the F-test for the significance of the regression is not applicable. The benchmark is the FTSE All Shares index and the panel has the yearly structure. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

**Constant Coefficient**

| Sample | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | Funds | Obs. |
|---|---|---|---|---|
| *Internally Managed* | | | | |
| Equity Funds | **0.1607**** | **0.1693** | 596 | 6443 |
| | (0.041) | (0.121) | | |
| Emerging Equity Funds | **0.8936**** | **0.6198**** | 5 | 48 |
| | (0.012) | (0.041) | | |
| International Equity Funds | **0.1390** | **0.1453** | 327 | 3634 |
| | (0.297) | (0.371) | | |
| UK Equity Funds | **0.1765***** | **0.1930***** | 264 | 2761 |
| | (0.000) | (0.001) | | |
| *Externally Managed* | | | | |
| Equity Funds | **0.2963***** | **0.3279**** | 2975 | 14629 |
| | (0.000) | (0.031) | | |
| Emerging Equity Funds | **1.0024***** | **0.9241***** | 178 | 666 |
| | (0.007) | (0.000) | | |
| International Equity Funds | **0.3019*** | **0.3121** | 1565 | 7977 |
| | (0.091) | (0.209) | | |
| UK Equity Funds | **0.2104***** | **0.2826***** | 1232 | 5986 |
| | (0.007) | (0.000) | | |

The regression results of specification (4) show that most of this outperformance is explained by the chosen variables. Table 4.9.A reports the results for the internal samples and Table 4.9.B has the results for the external samples, both with the square root function of fund's age. The results with the other age functions are very consistent with these and are not presented for brevity.

As previously, there are differences between the samples. In the all-equity sample there is no direct relationship between performance and fund's age for either management type. The interaction between fund's age and provider's age is insignificant for the internal funds but it is highly significant for the external funds. In detail, the performance for providers that are 5-10 and 10-15 years old declines with fund's age relative to the 20+ group. Table 4.9.B shows that this result is driven by the international equity sample. Although equity funds generally need to catch-up with their PPBs, this result suggests that at least some externally managed funds score their highest performance against the FTSE All Shares index right at the beginning of their operation. Interestingly, a similar result appears also for international funds that are internally managed. In that case, funds by providers that are up to 5 years old have significant outperformance relative to the oldest providers and this outperformance declines with fund's age.

The results for the other equity subsamples follow the familiar catching-up pattern. The M2 measure of internally managed UK equity funds increases with fund's age. However, the performance of external UK equity funds has no relationship with fund's age. This indicates that external managers have a better start relative to the FTSE All Shares index as they don't need to catch-up with it. Still, external managers of emerging equity funds need some time to catch up with the FTSE. This is possibly due to emerging equity being a relatively young investment style. Overall, external funds perform better relative to the FTSE All Shares index. Moreover, the results indicate that external funds manage to outperform the FTSE index when they are young whereas internal funds are rather subject to a learning period.

Concerning the other variables there are few differences. Externally managed funds are more affected by changing market conditions; the performance of emerging and UK equity funds significantly decreases whereas international equity funds perform significantly higher during

PPB bear periods. There is only a slight indication that the difference-in-returns increases during PPB bull markets for internally managed funds. This is consistent with the findings where the PPB is the benchmark.

Table 4.9.A. Results for the internally managed equity fund samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The FTSE All Shares index is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | International | | UK | |
|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| ***Constant*** | **-0.3985** | **-0.5930** | **-1.0619** | **-1.4775** | **-0.0363** | **0.0118** |
| | (0.485) | (0.230) | (0.274) | (0.114) | (0.950) | (0.980) |
| $f(age_{i,t})$ | **0.0264** | **0.0179** | **0.0214** | **-0.0599** | **0.0461** | **0.1118*** |
| | (0.857) | (0.912) | (0.932) | (0.812) | (0.479) | (0.067) |
| $Bear_{i,t}$ | **-0.5379** | **-0.2639** | **-0.8069** | **-0.2946** | **-0.0020** | **-0.0738** |
| | (0.193) | (0.534) | (0.205) | (0.635) | (0.992) | (0.679) |
| $Bull_{i,t}$ | **0.4485*** | **0.1304** | **0.5426** | **0.2901** | **0.3060** | **-0.0777** |
| | (0.054) | (0.514) | (0.111) | (0.251) | (0.262) | (0.643) |
| $Size_{i,t-1}$ | **-0.0117** | **0.0924** | **-0.1582** | **0.0164** | **0.0552** | **0.0535** |
| | (0.933) | (0.343) | (0.461) | (0.913) | (0.410) | (0.503) |
| $Share_{i,t-1}$ | **0.0073** | **0.0032** | **0.0675***** | **0.0468**** | **0.0014** | **-0.0011** |
| | (0.308) | (0.534) | (0.003) | (0.010) | (0.817) | (0.828) |
| $ABIshare_{i,t-1}$ | **0.0098** | **0.0006** | **-0.0317** | **-0.0293** | **0.0290***** | **0.0148*** |
| | (0.494) | (0.960) | (0.244) | (0.236) | (0.008) | (0.096) |
| $p0\_5_{i,t}$ | **0.8669** | **1.1210** | **2.2798**** | **2.5672*** | **-0.5338** | **-0.2770** |
| | (0.248) | (0.179) | (0.048) | (0.059) | (0.514) | (0.685) |
| $p5\_10_{i,t}$ | **-0.2789** | **0.3360** | **0.7162** | **1.3469** | **-0.3906** | **-0.2190** |
| | (0.721) | (0.593) | (0.531) | (0.182) | (0.294) | (0.479) |
| $p10\_15_{i,t}$ | **-0.1158** | **0.1860** | **0.2114** | **0.5908** | **-0.3872*** | **-0.1838** |
| | (0.802) | (0.689) | (0.805) | (0.412) | (0.056) | (0.369) |
| $p15\_20_{i,t}$ | **-0.1635** | **0.0531** | **-0.2100** | **0.0140** | **-0.1104** | **0.2058** |
| | (0.551) | (0.846) | (0.689) | (0.976) | (0.539) | (0.168) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **-0.2941** | **-0.3681** | **-1.1808**** | **-1.2690*** | **0.4633** | **0.3718** |
| | (0.473) | (0.413) | (0.026) | (0.070) | (0.353) | (0.368) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0831** | **-0.1093** | **-0.2842** | **-0.4787** | **0.0200** | **-0.0203** |
| | (0.758) | (0.622) | (0.460) | (0.160) | (0.884) | (0.887) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0320** | **-0.0417** | **-0.0973** | **-0.1913** | **0.1300**** | **0.0857** |
| | (0.829) | (0.771) | (0.707) | (0.364) | (0.030) | (0.133) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **0.0652** | **0.0068** | **0.0742** | **0.0185** | **0.0444** | **-0.0393** |
| | (0.388) | (0.925) | (0.579) | (0.874) | (0.369) | (0.345) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0123** | **-0.0121** | **0.0467** | **0.0095** | **-0.0025** | **-0.0074** |
| | (0.646) | (0.555) | (0.271) | (0.759) | (0.829) | (0.609) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.1820*** | **0.2210**** | **0.2814**** | **0.3212**** | **0.0203** | **0.0582** |
| | (0.057) | (0.021) | (0.037) | (0.023) | (0.650) | (0.167) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0903** | **-0.0342** | **-0.0909** | **-0.0452** | **-0.0767** | **-0.0156** |
| | (0.151) | (0.523) | (0.330) | (0.548) | (0.232) | (0.686) |
| $PPP_t$ | **0.2607** | **0.4674** | **0.9637** | **1.4042*** | **-0.3602** | **-0.3140** |
| | (0.598) | (0.344) | (0.146) | (0.062) | (0.370) | (0.359) |
| $STK_t$ | **-0.0395** | **0.0271** | **-0.1588** | **0.0168** | **-0.0870** | **-0.0665** |
| | (0.877) | (0.907) | (0.659) | (0.957) | (0.453) | (0.537) |
| $R^2$ within | 0.0359 | 0.0699 | 0.0613 | 0.1247 | 0.0567 | 0.0931 |
| F-statistic | 8.4065 | 6.2092 | 38.5985 | 15.8081 | 16.5130 | 12.3651 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 596 | 596 | 327 | 327 | 264 | 264 |
| Observations | 6417 | 6417 | 3623 | 3623 | 2746 | 2746 |

Table 4.9.B. Results for the externally managed equity fund samples with $f(age_{i,t}) = \sqrt{age_{i,t}}$. The FTSE All Shares index is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | Emerging | | International | | UK | |
|---|---|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| ***Constant*** | **-0.5168** | **-0.2700** | **-3.0439**** | **-1.0591** | **-1.0635** | **-1.3143** | **0.3312** | **0.7944*** |
| | (0.433) | (0.711) | (0.027) | (0.145) | (0.376) | (0.271) | (0.593) | (0.076) |
| $f(age_{i,t})$ | **0.2194** | **0.0690** | **1.0871*** | **0.4960** | **0.3226** | **0.0832** | **0.0930** | **0.1144** |
| | (0.189) | (0.727) | (0.095) | (0.240) | (0.202) | (0.760) | (0.620) | (0.561) |
| $Bear_{i,t}$ | **0.1005** | **0.6599*** | **-3.5403***** | **-0.6276***** | **1.1032***** | **1.6513***** | **-0.3472**** | **-0.0029** |
| | (0.633) | (0.088) | (0.000) | (0.001) | (0.007) | (0.003) | (0.049) | (0.992) |
| $Bull_{i,t}$ | **0.2475** | **0.0755** | **0.7430** | **0.1046** | **0.7804*** | **0.6641** | **-0.1476** | **-0.3200** |
| | (0.393) | (0.830) | (0.184) | (0.835) | (0.067) | (0.105) | (0.374) | (0.282) |
| $Size_{i,t-1}$ | **0.3192** | **0.2021** | **0.5242** | **-0.0873** | **0.5415** | **0.5286** | **-0.0444** | **-0.1446** |
| | (0.150) | (0.356) | (0.520) | (0.877) | (0.344) | (0.284) | (0.913) | (0.545) |
| $Share_{i,t-1}$ | **0.0074** | **0.0058** | **0.0282** | **0.0138** | **0.0062** | **0.0024** | **0.0114** | **0.0172**** |
| | (0.430) | (0.379) | (0.391) | (0.494) | (0.559) | (0.753) | (0.286) | (0.049) |
| $ABIshare_{i,t-1}$ | **-0.0023** | **-0.0049**** | **-0.0196** | **-0.0407***** | **-0.0031** | **-0.0046** | **-0.0003** | **-0.0025** |
| | (0.364) | (0.020) | (0.371) | (0.000) | (0.449) | (0.211) | (0.875) | (0.483) |
| $p0\_5_{i,t}$ | **0.0231** | **-0.5337** | **2.0128** | **0.3619** | **-0.5526** | **-0.9567** | **0.1709** | **-0.2451** |
| | (0.951) | (0.273) | (0.283) | (0.732) | (0.428) | (0.227) | (0.688) | (0.480) |
| $p5\_10_{i,t}$ | **0.4492** | **0.0730** | **3.7991***** | **1.7636**** | **0.1835** | **0.0321** | **0.2991** | **-0.0536** |
| | (0.285) | (0.854) | (0.007) | (0.033) | (0.800) | (0.961) | (0.364) | (0.767) |
| $p10\_15_{i,t}$ | **0.4769*** | **0.0094** | **2.1734*** | **1.5924**** | **0.2844** | **-0.2151** | **0.4416** | **0.0162** |
| | (0.078) | (0.972) | (0.060) | (0.012) | (0.546) | (0.640) | (0.342) | (0.953) |
| $p15\_20_{i,t}$ | **0.3557** | **0.1178** | **1.6939*** | **0.1435** | **0.1726** | **-0.0209** | **0.2737** | **0.2024** |
| | (0.224) | (0.562) | (0.070) | (0.732) | (0.756) | (0.965) | (0.379) | (0.264) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **-0.1190** | **0.0717** | **-0.3404** | **0.1475** | **-0.0434** | **0.1585** | **-0.0323** | **0.0375** |
| | (0.564) | (0.713) | (0.281) | (0.586) | (0.878) | (0.572) | (0.908) | (0.843) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **-0.2613**** | **-0.1434*** | **-0.6761** | **-0.1517** | **-0.2296** | **-0.1613** | **-0.1659** | **-0.0861** |
| | (0.018) | (0.065) | (0.191) | (0.544) | (0.243) | (0.248) | (0.366) | (0.429) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.2462**** | **-0.1313** | **-0.2902** | **-0.2118** | **-0.2591*** | **-0.0943** | **-0.1497** | **-0.0775** |
| | (0.029) | (0.182) | (0.402) | (0.394) | (0.068) | (0.510) | (0.514) | (0.590) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0949** | **-0.0518** | **-0.1688** | **0.2452** | **-0.0499** | **-0.0165** | **-0.0845** | **-0.0949** |
| | (0.191) | (0.325) | (0.558) | (0.105) | (0.630) | (0.863) | (0.502) | (0.254) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0878**** | **-0.0504** | **-0.0422** | **0.1612** | **-0.1269** | **-0.1122** | **-0.0238** | **0.0046** |
| | (0.043) | (0.190) | (0.823) | (0.249) | (0.248) | (0.228) | (0.834) | (0.946) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **-0.0082** | **0.0012** | **0.4308***** | **0.1336**** | **-0.2289** | **-0.1640** | **0.0701*** | **0.0239** |
| | (0.938) | (0.988) | (0.000) | (0.024) | (0.109) | (0.141) | (0.099) | (0.768) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **0.0187** | **-0.0068** | **-0.2081** | **-0.1002** | **-0.0654** | **-0.1159** | **0.0160** | **0.0117** |
| | (0.802) | (0.938) | (0.308) | (0.476) | (0.538) | (0.241) | (0.752) | (0.893) |
| $PPP_t$ | **0.2284** | **0.4188** | | | **0.5076** | **0.9960** | **-0.3638** | **-0.5014*** |
| | (0.725) | (0.543) | | | (0.609) | (0.334) | (0.168) | (0.097) |
| $STK_t$ | **-0.2495** | **-0.1470** | **0.9258** | **0.7702** | **-0.6102** | **-0.2537** | **0.1880** | **0.0983** |
| | (0.433) | (0.601) | (0.273) | (0.281) | (0.241) | (0.460) | (0.568) | (0.741) |
| $R^2$ within | 0.0160 | 0.0950 | 0.5887 | 0.4049 | 0.0580 | 0.1993 | 0.0231 | 0.0639 |
| F-statistic | 19.2468 | 63.3169 | 68335.6307 | 4480.1137 | 47.5473 | 84.1043 | 57.6176 | 114.2223 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 2975 | 2975 | 178 | 178 | 1565 | 1565 | 1232 | 1232 |
| Observations | 14557 | 14557 | 664 | 664 | 7938 | 7938 | 5955 | 5955 |

### 4.4. Discussion

The main purpose of this chapter was to examine whether the externally managed funds perform differently than the internally managed funds. According to the central hypothesis there should be no difference in the performance of the internally and the externally managed funds and in what factors explain this performance.

The analysis has revealed that externally and internally managed funds have on average insignificant risk-adjusted returns (Sharpe ratio). Performance relative to the PPB is significant for all the styles and for both investment types, except the internally managed allocation funds and the externally managed fixed income funds for which it is insignificant. The performance relative to the PPB is higher for externally managed funds for all styles except fixed income funds. However, the descriptive statistics have highlighted possible differences in PPB selection where the external funds seem to have more favourable benchmarks.

There are also differences in the relationship between performance and fund's age. The M2 performance of the internally managed fixed income funds declines with fund's age whereas there is no change for any of the performance measures of the external fixed income funds. In the case of the internal equity funds, only the Sharpe ratio of the international equity funds increases with fund's age. However, the difference-in-returns of the emerging equity and the international equity funds as well as the M2 of the international equity funds increases with fund's age for the external samples. The only thing these results have in common is that funds investing in equity are more prone to going through a catching-up period.

Differences also appear in the way performance is explained by the other variables. Provider's age seems to have some explanatory power for the internal funds but the results do not show any distinct pattern. On the other hand, the performance of the external allocation funds follows a U-shape with middle-aged providers underperforming younger and older providers. At the same time younger providers of the external fixed income and the international equity funds perform better than older providers whereas for the emerging funds they do worse. The controls for market conditions show that the external managers have poor timing skills relative to the internal managers as they do not increase their performance in bull years whereas internal managers do. Moreover, variables that relate to economies of scale such as size and market share are more important for external funds. Finally, external managers seem to react more strongly to regulatory change.

The main contribution of this chapter is to highlight the importance of outsourcing which has been overlooked by most of the past performance literature. The chapter documents how outperformance has become the dominant management practice in the industry within only a few years. This immense development may appear to be advantageous to policyholders as most externally managed funds outperform their benchmarks more than internal ones do but this difference seems to be largely due to benchmark selection.

Much of the methodology here follows that from the previous chapter. As such, it is also subject to the same limitations. However, the omission of management fees is of much more consequence here. Although accounting for fees does not change the results in Chen et al. (2006) it is an important factor particularly if externally managed funds pose different fees than internal ones.

Outsourcing seems to have gathered a lot of momentum in the past decade within the pension fund industry. The results here show that it doesn't make a difference for policyholders in terms of risk-adjusted returns although external funds outperform their PPBs more than internal funds do, which raises questions on the benchmark selection. Future work can compare directly the performance of externally and internally managed funds instead of comparing the performance of each to their corresponding PPBs. This will involve a careful matching of fund and provider characteristics. Moreover, it will be useful to compare in detail the chosen benchmarks and examine if there are any differences, and specifically if external funds indeed choose more 'flattering' PPBs. A survey of pension providers and wealth management companies on benchmark selection may shed some light into this. Finally, further work is needed on the incentive structure of internal and external managers. This may extend to a study of the contracting practices for the managers as well as the agreements with the policyholders.

## CHAPTER 5: DETERMINANTS OF OUTSOURCING

This chapter investigates whether there are any economic factors that affect a pension provider's decision to outsource fund management. The first section reviews related literature and argues that in addition to the traditionally accounted for superior performance argument the growing trend to outsource is driven, at least partly, by a 'fashion to outsource'. In other words, the more outsourcing has taken place, the more likely it is that it will be implemented in the future. The second section explains the applied methodology and, in particular, describes how the 'fashion to outsource' is accounted for. The third section presents and discusses the results of the regression analysis. The chapter concludes with a discussion of the findings, limitations and proposes courses for future research.

### 5.1. Literature review and hypothesis statement

Previous research done on outsourcing of business functions has dealt with possible reasons to outsource (e.g. Loh and Venkatraman, 1992; Ang and Straub, 1998; Bryce and Useem, 1998). These can be summarised into three main groups. The first one is saving costs, i.e. it is more expensive to run a business function (particularly IT) internally than delegating it to an external company. The second one is poor performance in the sense that a business function performs poorly compared to peers and outsourcing it to an external company can produce better results. The third one relates to company size and potential exploitation of economies of scale, i.e. companies may be more inclined to outsource if they are small and cannot realise economies of scale. An external company, on the other hand, can bring together the services it provides to different clients and create economies of scale.

Despite the rapid development of management outsourcing for mutual and pension funds, as discussed in the previous chapter, there is very little empirical evidence on the reasons behind this particular type of outsourcing. The only work known to the author is by Cashman and Deli (2009). They argue that management outsourcing for US mutual funds is more likely when the fund's portfolio contains assets that are difficult to price, e.g. equities relative to bonds, or corporate relative to government bonds. Additionally, they show that two characteristics of providers also affect the decision to outsource. First, they find that large providers are less likely to outsource because they already benefit from economies of scale (the same argument as in the literature for business function outsourcing). Second, they find that a wider range of funds increases the probability of outsourcing, i.e., if a fund provider specialises in an investment style but still wishes to offer other styles, these will be outsourced. This is consistent with an argument provided by Chen et al. (2006) that providers face “capacity limits”.

The literature also mentions one more reason to outsource, but this one is more anecdotal than empirically tested. Weidenbaum (1998) discusses advantages and disadvantages of international outsourcing and cautions against the practice of outsourcing “because everybody is doing it” which may underestimate transaction costs etc. that arise from this decision. The previous chapter shows that external management grew enormously within a relatively short period of time. It also shows that there is no hard-core evidence that the externally managed funds perform better than the internally managed funds. For instance, Table 4.5 shows that indeed the externally managed funds seem better in beating their benchmarks than the internally managed funds, but there is no statistical evidence that they deliver better risk adjusted returns (the Sharpe ratios of both management types are insignificant). Outperforming PPBs (especially if they are deliberately chosen to be easy to beat because the actual portfolios contain assets more diversified than the benchmarks) can look nice in prospectuses sent to current and potential future contributors, but should not fool pension providers outsourcing the management of their funds. Therefore, this chapter tests whether there is any evidence in support of Weidenbaum’s (1998) assessment of the ‘everybody is doing it’ argument, i.e., whether a trend to outsource has any explanatory power in justifying decisions to outsource.

## 5.2. Methodology

The objective is to identify which factors affect the decision to outsource a fund. A cross section sample is constructed for this purpose using all 12,307 funds in the database. All observations are put together in a way that describes the personal pension fund industry at the exact time each fund opened.

The dependent variable $external_i$ is binary and equals one if the new fund is externally managed and zero if it is run in-house. The regression analysis is done with a Probit model and the observations are clustered by provider. The independent variables can be summarized in three groups: past performance, provider characteristics, and proxies for trend. The first two are based on the empirical results of previous research whereas the third group of proxies tests whether outsourcing can be explained by the amount of outsourcing that has been taking place. It should be noted at the start that given that there is no information about the costs involved for internal and external management, e.g. manager compensation, fees, transaction costs etc., a potential cost saving argument is not tested for. This is a potential limitation of this analysis.

*Past performance*

The above-mentioned research on outsourcing indicates that external management may be a solution for poor internal performance. Accordingly, good past performance of internally managed funds is expected to decrease the probability of outsourcing. At the same time, it is reasonable to assume that a provider will be more inclined to outsource if the externally managed funds performed well in the past, i.e. the probability of outsourcing will increase with the past performance of external funds. Four performance measures are considered: simple returns, Sharpe ratios, difference-in-returns, and the M2. The benchmark for the last two measures is the PPB. Each measure is calculated based on the monthly fund returns in the period prior to each fund's opening. The periods considered for past performance are the following:

- 12 months, i.e. the last year preceding fund inception;
- 12-24 months, i.e. the year before last which is the 'lag' of the first period;
- 24 months, i.e. the last two years preceding fund inception.

These periods do not correspond to calendar years but they refer to the date of each fund's opening. The last two periods are taken into account because it is probable that the decision to outsource is met some time before the fund's inception and therefore, providers are likely to assess relatively older performance data. Each new fund is matched to its corresponding group, which consists of funds that are run by the same provider and belong to the same ABI sector. In order to avoid heterogeneity, the matching group includes funds that have monthly return information for all months in the period under consideration. Once the matching group is identified, the average return is calculated across funds for each month in the above three periods to form the matching group's monthly returns. Then the arithmetic average and standard deviation of the group's monthly returns are calculated as proxies of past return and risk. The same procedure is applied for the PPB returns and risk as well as the risk-free return.[37] Table 5.1 shows the summary statistics for the past performance of the internal and external matching groups.

The minima and maxima of the constructed Sharpe ratios and M2 measures show that there are no outliers, and therefore, no winsorizing is needed. Table 5.1 also shows that the number of observations decreases as older periods are considered. Indeed, the limited availability of return observations shrinks the sample to less than half its original size.

Moreover, it is interesting to note that the past returns of the internal funds are larger than those of the external funds whereas the external funds outperform their PPBs more than the internal funds do. This is consistent with the findings of the previous chapter and points out again to the benchmark selection issue for the internal and the external funds.

[37] The risk-free return is approximated by the 1-month UK Treasury bill.

Table 5.1. Summary statistics for the past performance measures of internally and externally managed funds with the same ABI sector and operated by the same provider as the new fund.

| Management | Variable | Period | Obs. | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|---|---|
| Internal | Return | 12 | 6049 | 0.394 | 1.440 | -5.27 | 6.67 |
| | Sharpe | 12 | 6049 | 0.037 | 0.492 | -8.50 | 3.21 |
| | $R_{Fund}$-$R_{PPB}$ | 12 | 2631 | 0.145 | 0.639 | -5.01 | 3.00 |
| | M2 | 12 | 2631 | 0.202 | 0.668 | -4.98 | 10.68 |
| External | Return | 12 | 5122 | 0.248 | 1.622 | -5.54 | 8.74 |
| | Sharpe | 12 | 5122 | 0.030 | 0.412 | -1.75 | 1.93 |
| | $R_{Fund}$-$R_{PPB}$ | 12 | 4623 | 0.205 | 0.525 | -5.01 | 7.21 |
| | M2 | 12 | 4623 | 0.226 | 0.488 | -4.00 | 7.33 |
| Internal | Return | 12-24 | 5857 | 0.685 | 1.297 | -4.72 | 5.86 |
| | Sharpe | 12-24 | 5857 | 0.104 | 0.507 | -11.50 | 3.25 |
| | $R_{Fund}$-$R_{PPB}$ | 12-24 | 2516 | 0.170 | 0.510 | -4.47 | 3.42 |
| | M2 | 12-24 | 2516 | 0.155 | 0.541 | -6.61 | 7.00 |
| External | Return | 12-24 | 4738 | 0.615 | 1.421 | -5.25 | 11.06 |
| | Sharpe | 12-24 | 4738 | 0.122 | 0.389 | -3.00 | 1.97 |
| | $R_{Fund}$-$R_{PPB}$ | 12-24 | 4306 | 0.220 | 0.473 | -4.44 | 8.27 |
| | M2 | 12-24 | 4306 | 0.203 | 0.435 | -4.00 | 4.01 |
| Internal | Return | 24 | 5849 | 0.544 | 0.948 | -3.06 | 4.26 |
| | Sharpe | 24 | 5849 | 0.054 | 0.377 | -12.00 | 2.94 |
| | $R_{Fund}$-$R_{PPB}$ | 24 | 2509 | 0.145 | 0.410 | -2.41 | 2.39 |
| | M2 | 24 | 2509 | 0.151 | 0.505 | -3.74 | 8.77 |
| External | Return | 24 | 4726 | 0.436 | 1.034 | -3.22 | 5.05 |
| | Sharpe | 24 | 4726 | 0.048 | 0.287 | -1.67 | 1.27 |
| | $R_{Fund}$-$R_{PPB}$ | 24 | 4298 | 0.216 | 0.326 | -1.94 | 5.78 |
| | M2 | 24 | 4298 | 0.202 | 0.307 | -1.54 | 4.00 |

Ideally, the regression specification should include the past performance measure of both internal and external funds so that it can be clearly distinguished which of the two has the strongest effect (if at all). However, this is not possible for simple fund returns and the Sharpe ratio as the correlation coefficient between internal and external funds is above 0.9 for all periods. Consequently, the difference of internal minus external performance is calculated and used in the regressions instead. This is not a problem for the difference-in-returns and M2 measures since the corresponding correlation coefficients range between 0.1 and 0.33.

The four performance measures are used alternatively in the regressions, i.e.

$$Performance_{i,t} = \{\, dR_{i,t}\, ; dSharpe_{i,t}\, ; (R_{Fund} - R_{PPB})^{in}_{i,t}\ ,\ (R_{Fund} - R_{PPB})^{ex}_{i,t}\ ;\ M2^{in}_{i,t}\ ,\ M2^{ex}_{i,t}\,\}\ ,$$

where each measure refers to the group that matches fund '$i$' and '$t$' is the period prior to this fund's inception (12, 12-24, and 24 months). The superscripts 'in' and 'ex' signify 'internal' and 'external' respectively. The first two measures are calculated as $dR_{i,t} = R_{i,t}^{in} - R_{i,t}^{ex}$ and $dSharpe_{i,t} = Sharpe_{i,t}^{in} - Sharpe_{i,t}^{ex}$.

*Provider's characteristics*

The work by Cashman and Deli (2009) indicates that smaller mutual fund providers are more likely to outsource fund management and so do fund families with a wide range of funds. They measure size with the value of assets under management and investment style range with the number of funds in operation. These two measures cannot be applied here for two reasons. First, the number of funds in operation does not represent the range of investment styles since it is possible that a provider operates many funds of the same style. Second, there is no information for assets under management and, therefore, size must be approximated by another variable.

The range of funds is approximated here by the share of the new fund's ABI sector within the provider's portfolio of funds. The definition is identical to that of ABI's share in Chapter 3, i.e. it is the ratio of the number of funds with the same ABI sector and provider as the new fund $i$ over all funds that the provider operates at the time the new fund opened, expressed as a percentage ($Range_i$). This variable measures the degree of the provider's specialisation in the corresponding ABI sector and the higher it is the lower the probability to outsource the new fund is expected to be.

The provider's size cannot be approximated by the number of funds in operation as in Chapter 3. The reason for this is that both the number of operated funds and that of outsourced funds increase over time and are highly correlated. Thus, size measured in this way will be significant but the result will be spurious due this correlation. An alternative way to measure the provider's size is relative to the whole market, i.e. using the provider's market share. To this effect, market share is proxied by the total number of funds operated by the same provider expressed as a percentage of the total number of funds in the market at the time the new fund opens ($Share_i$). Providers with smaller market share are expected to be more likely to outsource, assuming that they cannot realise economies of scale internally due to lack of size. A similar variable is the relative size in the fund's ABI sector which relates to economies of scale for the fund's particular investment style. This is proxied by the total number of funds with the same ABI that the provider operates as a percentage of the total number of funds with the same ABI in the market when the new fund opens ($Share\_ABI_i$). Providers with a large market share in the new fund's ABI are expected to be less likely to outsource the new fund since they may realise economies of scale internally (same as with $Share_i$).

The last characteristic refers to the provider's origin. Providers that are founded outside the UK may be more inclined to hire external managers, particularly before establishing themselves in the local market. At the same time, domestic providers may be better informed about local wealth management companies and thus, outsourcing will involve fewer costs, in terms of contracting, information gathering etc. Therefore, being an international provider may both increase and decrease the probability of outsourcing. The provider's origin is proxied by a dummy variable, which equals 1 if the provider is founded outside the UK and 0 otherwise ($Prov\_nonUK_i$).[38]

*Trend*

The purpose of the trend proxies is to detect whether there is general tendency to outsource more, which is not due to performance or any other of the above factors, but simply because the market has acquired a habit of hiring external managers. There are three pairs of trend proxies and each pair includes two proxies, one for the market's trend and one for the provider's trend to outsource. First, it is considered how much the overall market uses external management. This is measured by the number of externally managed funds as a percentage of all funds existing in the market at the time each new fund opens ($Trend$). This accounts for all funds that have been opened prior to the new fund's inception and as such, is considered to be a long-term measure of the outsourcing trend. The same measure is calculated for the provider of each new fund, i.e. the number of funds the provider outsources as a percentage of all funds that the provider operates ($Pr\_Trend$).

[38] Founding information has been collected manually from the history statement of each provider's website.

The second pair measures the degree of outsourcing the new fund's ABI style. For the total market it is calculated as the ratio of the number of all funds with the same ABI sector that are externally managed over the number of all funds with the same ABI sector at the time of the new fund's inception ($ABItrend$). For the fund's provider it is the number of externally managed funds with the same ABI sector and provider as a percentage of all the provider's funds ($Pr\_ABItrend$).

The third pair measures how much the market and the provider have outsourced shortly before the opening of each fund. This is a rather short-term measure of the outsourcing trend and it is named '*propensity*' in order to distinguish it from the long-term '*trend*'. Propensity is measured in the same way as trend but only the funds that are opened within a particular period are considered. The periods are defined in the same way as past performance, namely 12, 12-24, and 24 months prior to the fund's inception. So for example, the market's propensity to outsource in the last 12 months is calculated as the number of all outsourced funds that opened in this period expressed as a percentage of all funds that opened in the same period. The market's propensity to outsource in period '$t$' is named '$Propensity_t$' and the provider's propensity to outsource is named '$Pr\_Propensity_t$'.

*Additional controls*

As discussed in Chapter 3, performance is affected by changing market conditions. Nevertheless, creating market condition dummies cannot be done in the same way for this analysis. The reason is that the observations are cross-sectional and the periods over which performance is measured differs for each fund and does not correspond to calendar years. The definition in Chapter 3 is based on negative/positive return and above/below average volatility. It is relatively straightforward to calculate the average PPB return for each fund's matching group (as is indeed done in order to calculate the difference-in-returns and M2). On the other hand, it is hard to assess whether the overall PPB volatility of the matching group is above or below average, simply because the calculation of this average presupposes the calculation of intermediate volatilities (e.g. quarterly). However, the performance measures do not correspond to any calendar periods and so there would be a mismatch between performance and these intermediate volatilities.

In order to sidestep this problem, the broader definition in Fabozzi and Francis (1977) is applied whereby an average negative return signifies a bear market and a positive return a bull market. Average PPB returns are calculated in the same way as for the past performance measures, i.e. the returns' arithmetic average in the 12, 12-24, and 24 months before inception. The matching group includes all funds with the same ABI sector in the market. Moreover, Chapter 4 indicates that there may be differences between the benchmarks of internal and external funds. For this reason, the matching group of PPB returns is further separated into internally and externally managed funds. Bear markets are proxied by a dummy, which equals 1 if the average PPB return of both internal and external funds in the considered period is negative and 0 otherwise, $\{Bear_{12}$; $Bear_{12-24}$; $Bear_{24}\}$. A dummy for bull markets can be defined in the same way (i.e. it equals 1 if both averages are positive) but its correlation to the bear dummy is -0.9 so only the bear dummy is used in the regressions.

To summarize, Probit regressions are run on the following specification:

$$External_i = Constant + \gamma_1 Performance_{i,t} + \gamma_2 Share_i + \gamma_3 Share\_ABI_i + \gamma_4 Range_i + \gamma_5 Prov\_nonUK_i + \gamma_6 Bear_t + \gamma_7 Market\ Trend_t + \gamma_8 Provider\ Trend_t + error \quad (1)$$

The regression is repeated for each past performance measure and pair of trend proxies. It is also repeated for the three periods (12, 12-24, and 24 months) where the past performance measure, the bear market dummy, and the propensity to outsource (when applicable) change together according to the period under consideration. Tables 5.2 and 5.3 show the summary statistics of all the explanatory variables. Table 5.2 shows the statistics for the past performance measures. It is different from Table 5.1 in that it contains the difference in fund returns and the Sharpe ratio as well as only those observations that are included in the regression. The number of available observations is reduced down to how many funds have past performance information for both internal and external funds.

Table 5.2. Summary statistics of all variables measuring past performance, sorted by the number months prior to fund inception over which past performance is calculated.

| Variable | Mean | St.dev. | Min | Max | Obs. |
|---|---|---|---|---|---|
| | | *12 months* | | | |
| $dR_{i,12}$ | -0.05 | 0.38 | -2.39 | 2.19 | 3725 |
| $dSharpe_{i,12}$ | -0.01 | 0.11 | -0.92 | 1.02 | 3725 |
| $(R_{Fund} - R_{PPB})_{i,12}^{in}$ | 0.13 | 0.64 | -3.71 | 2.92 | 1702 |
| $(R_{Fund} - R_{PPB})_{i,12}^{ex}$ | 0.24 | 0.36 | -2.43 | 1.88 | 1702 |
| $M2_{i,12}^{in}$ | 0.19 | 0.45 | -2.70 | 2.42 | 1702 |
| $M2_{i,12}^{ex}$ | 0.24 | 0.33 | -1.12 | 1.46 | 1702 |
| | | *12-24 months* | | | |
| $dR_{i,12-24}$ | -0.07 | 0.39 | -2.39 | 2.20 | 3476 |
| $dSharpe_{i,12-24}$ | -0.01 | 0.13 | -0.80 | 1.67 | 3476 |
| $(R_{Fund} - R_{PPB})_{i,12-24}^{in}$ | 0.13 | 0.46 | -4.47 | 2.76 | 1577 |
| $(R_{Fund} - R_{PPB})_{i,12-24}^{ex}$ | 0.21 | 0.36 | -1.97 | 2.91 | 1577 |
| $M2_{i,12-24}^{in}$ | 0.13 | 0.38 | -2.72 | 2.29 | 1577 |
| $M2_{i,12-24}^{ex}$ | 0.15 | 0.36 | -2.37 | 2.48 | 1577 |
| | | *24 months* | | | |
| $dR_{i,24}$ | -0.06 | 0.26 | -1.58 | 1.80 | 3464 |
| $dSharpe_{i,24}$ | -0.01 | 0.08 | -0.64 | 0.82 | 3464 |
| $(R_{Fund} - R_{PPB})_{i,24}^{in}$ | 0.12 | 0.41 | -2.41 | 1.78 | 1571 |
| $(R_{Fund} - R_{PPB})_{i,24}^{ex}$ | 0.22 | 0.21 | -1.36 | 1.04 | 1571 |
| $M2_{i,24}^{in}$ | 0.11 | 0.35 | -1.94 | 1.48 | 1571 |
| $M2_{i,24}^{ex}$ | 0.18 | 0.20 | -0.61 | 1.11 | 1571 |

Table 5.3 shows the summary statistics for all the remaining explanatory variables. Because there are more observations available for the past fund return and Sharpe ratio than for the performance relative to the PPB the summary statistics in Table 5.3 are calculated twice to match the corresponding past performance observations.

Table 5.3. Summary statistics of all independent variables (excl. past performance), sorted by matching performance sample, and number of months prior to fund inception over which the past performance, the bear dummy, and the propensity variables are calculated.

| | Return & Sharpe | | | | $R_{Fund}$-$R_{PPB}$ & M2 | | | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | **Mean** | **St.dev.** | **Min** | **Max** | **Mean** | **St.dev.** | **Min** | **Max** |
| | | | | *12 months* | | | | |
| $Share_i$ | 5.36 | 2.45 | 0.36 | 18.49 | 4.81 | 1.99 | 0.48 | 18.49 |
| $Share\_ABI_i$ | 7.34 | 5.59 | 0.69 | 46.15 | 6.62 | 4.54 | 0.69 | 31.61 |
| $Range_i$ | 9.44 | 6.48 | 0.58 | 59.52 | 10.97 | 6.69 | 0.98 | 59.52 |
| $Prov\_nonUK_i$ | 0.52 | 0.50 | 0.00 | 1.00 | 0.43 | 0.50 | 0.00 | 1.00 |
| $Bear_{12}$ | 0.37 | 0.48 | 0.00 | 1.00 | 0.38 | 0.48 | 0.00 | 1.00 |
| $Trend$ | 42.30 | 12.95 | 8.80 | 58.92 | 44.13 | 11.00 | 13.06 | 58.92 |
| $Pr\_Trend$ | 57.08 | 23.60 | 5.26 | 90.95 | 49.67 | 20.19 | 6.36 | 90.35 |
| $ABItrend$ | 50.50 | 18.46 | 2.78 | 93.62 | 53.28 | 15.03 | 2.78 | 93.62 |
| $Pr\_ABItrend$ | 60.82 | 24.13 | 4.62 | 97.56 | 54.11 | 23.48 | 4.62 | 94.05 |
| $Propensity_{12}$ | 74.44 | 19.04 | 4.60 | 89.60 | 78.02 | 13.58 | 4.60 | 89.60 |
| $\mathrm{Pr}\_Propensity_{12}$ | 72.47 | 32.98 | 0.00 | 100.00 | 70.74 | 33.33 | 0.00 | 100.00 |
| | | | | *12-24 months* | | | | |
| $Share_i$ | 5.43 | 2.42 | 0.48 | 16.20 | 4.89 | 1.93 | 0.48 | 16.20 |
| $Share\_ABI_i$ | 7.31 | 5.45 | 0.69 | 42.27 | 6.70 | 4.56 | 0.69 | 31.61 |
| $Range_i$ | 9.60 | 6.50 | 0.94 | 59.52 | 11.24 | 6.76 | 0.98 | 59.52 |
| $Prov\_nonUK_i$ | 0.52 | 0.50 | 0.00 | 1.00 | 0.43 | 0.50 | 0.00 | 1.00 |
| $Bear_{12-24}$ | 0.25 | 0.43 | 0.00 | 1.00 | 0.23 | 0.42 | 0.00 | 1.00 |
| $Trend$ | 42.24 | 12.89 | 8.80 | 58.92 | 44.03 | 11.03 | 13.06 | 58.92 |
| $Pr\_Trend$ | 57.22 | 23.60 | 5.26 | 90.95 | 49.35 | 20.12 | 6.36 | 90.35 |
| $ABItrend$ | 50.25 | 18.16 | 3.00 | 93.62 | 53.08 | 14.95 | 3.02 | 93.62 |
| $Pr\_ABItrend$ | 60.78 | 24.29 | 4.62 | 97.06 | 53.87 | 23.48 | 4.62 | 94.05 |
| $Propensity_{12-24}$ | 70.01 | 20.09 | 5.95 | 88.23 | 72.77 | 15.87 | 11.65 | 88.23 |
| $\mathrm{Pr}\_Propensity_{12-24}$ | 69.70 | 33.18 | 0.00 | 100.00 | 65.04 | 33.10 | 0.00 | 100.00 |
| | | | | *24 months* | | | | |
| $Share_i$ | 5.42 | 2.42 | 0.48 | 16.20 | 4.88 | 1.92 | 0.48 | 16.20 |
| $Share\_ABI_i$ | 7.31 | 5.46 | 0.69 | 42.27 | 6.71 | 4.57 | 0.69 | 31.61 |
| $Range_i$ | 9.61 | 6.50 | 0.94 | 59.52 | 11.25 | 6.77 | 0.98 | 59.52 |
| $Prov\_nonUK_i$ | 0.52 | 0.50 | 0.00 | 1.00 | 0.43 | 0.50 | 0.00 | 1.00 |
| $Bear_{24}$ | 0.34 | 0.47 | 0.00 | 1.00 | 0.36 | 0.48 | 0.00 | 1.00 |
| $Trend$ | 42.33 | 12.82 | 8.80 | 58.92 | 44.14 | 10.92 | 13.06 | 58.92 |
| $Pr\_Trend$ | 57.31 | 23.59 | 5.26 | 90.95 | 49.42 | 20.12 | 6.36 | 90.35 |
| $ABItrend$ | 50.37 | 18.07 | 3.00 | 93.62 | 53.23 | 14.77 | 3.02 | 93.62 |
| $Pr\_ABItrend$ | 60.87 | 24.27 | 4.62 | 97.06 | 53.95 | 23.48 | 4.62 | 94.05 |
| $Propensity_{24}$ | 72.77 | 18.96 | 10.78 | 87.80 | 75.88 | 14.05 | 11.73 | 87.80 |
| $\mathrm{Pr}\_Propensity_{24}$ | 75.56 | 24.80 | 0.00 | 100.00 | 74.07 | 21.86 | 0.00 | 100.00 |

The correlation coefficients of the chosen explanatory variables are very similar for all the variants of specification (1). Table 5.4 shows the pairwise correlations for the specification with the difference in fund return as past performance measure and the long-term trend proxies. The period considered are the 12 months prior to each fund's opening. There is some correlation between the provider's total market share and market share in each ABI sector as well as between the market and the provider's trend to outsource. However, collinearity diagnostics for all possible specification (not shown here) indicate that this degree of correlation does not impair the estimation. The mean VIF does not exceed the value of 1.5 and all condition numbers are around 10.

Table 5.4. Correlation coefficients between independent variables. In bold are correlations with absolute value larger than 0.4. The past performance and the bear market dummy refer to the 12 months preceding the fund's inception. The pair of the long-term trend to outsource is chosen.

| | $dR_{i,12}$ | $Share_i$ | $Share\_ABI_i$ | $Range_i$ | $Prov\_nonUK_i$ | $Bear_{12}$ | $Trend$ | $Pr\_Trend$ |
|---|---|---|---|---|---|---|---|---|
| $dR_{i,12}$ | 1 | | | | | | | |
| $Share_i$ | 0.0675 | 1 | | | | | | |
| $Share\_ABI_i$ | 0.0894 | **0.4156** | 1 | | | | | |
| $Range_i$ | 0.0510 | -0.0788 | 0.3252 | 1 | | | | |
| $Prov\_nonUK_i$ | 0.0249 | 0.0780 | 0.1157 | 0.0252 | 1 | | | |
| $Bear_{12}$ | 0.1467 | 0.0476 | 0.0052 | -0.0165 | 0.0136 | 1 | | |
| $Trend$ | 0.0060 | 0.0507 | -0.0711 | -0.1752 | 0.1224 | 0.1860 | 1 | |
| $Pr\_Trend$ | 0.0188 | 0.1870 | 0.1268 | -0.1716 | 0.3278 | 0.1606 | **0.6551** | 1 |

## 5.3. Regression analysis

The results for the Probit regressions are shown in Tables 5.5 to 5.7. Each table has the same set of regression specifications where the only variable that alternates is the proxy for the trend to outsource. Table 5.5 contains the long-term trend of the market and the provider to outsource any fund type. Table 5.6 includes the trend of the market and the provider to outsource funds of the same ABI sector as the new fund. Table 5.7 has the market's and the provider's propensity (i.e. 'short-term' trend) to outsource any fund type. The results in each table are sorted according to the period over which the past performance, the bear market dummy, and the propensity to outsource (where applicable) are calculated. Then, for each period, results are sorted according to which past performance measure is used. As a reminder, only the difference between the internal and the external fund returns and Sharpe ratio is taken due to the high correlation of these two measures between management types. For the performance measures relative to the PPB it is possible to separate into past internal and external performance. Given that Probit is used to estimate the regressions the estimated coefficients cannot be interpreted directly. The sign of the estimated coefficients (in bold) indicates whether the variable in question increases or decreases the probability to outsource the new fund. How much the probability will change depends on the actual value of the explanatory variable. However, it is possible to estimate how much the probability to outsource changes at the variable means (shown in Tables 5.2 and 5.3) which is known as 'marginal effect' and this is reported in italic below each coefficient.[39]

The results show that the decision to outsource is affected by past performance. Indeed, this appears for all periods prior to the new fund's opening suggesting that providers consider at least the past two years of performance. The coefficient in front of the Sharpe ratio difference is the most robust result among past performance measures. The coefficient's sign is negative which is consistent with the hypothesis that the past performance of the internal funds decreases and that of the external funds increases the probability to outsource. When the performance relative to the PPB is considered, it is mostly the positive effect of the external funds' outperformance that makes a difference whereas that of the internal funds is rather insignificant. The difference in simple fund returns is insignificant. In terms of marginal

[39] For continuous variables the marginal effect calculation is made for an infinitesimal change in the variable whereas for discrete variables (dummies) it is made for a discrete change from 0 to 1.

effects, the difference in the Sharpe ratio has a very strong effect, i.e. if the difference increases by 1% at the mean, then the probability to outsource increases by about 20%. Note, that the bear market dummy is insignificant and does not affect the decision to outsource.

From the provider's characteristics only the market share in the new fund's ABI sector remains significant for all specifications. Its coefficient has a negative sign indicating that providers who have a large market share of the new fund's investment style are less likely to outsource (consistent with the economies of scale argument). The marginal effect of a 1% increase in market share at the mean ranges between 1% and 2%. At the same time the provider's market share (proxy for relative size) has on several occasions a significantly positive coefficient with a marginal effect of around 3%. Both were expected to have negative coefficients so this result indicates that the economies-of-scale argument applies to individual investment styles but not to the overall size of the provider. At the same time, the degree of specialization in the new fund's ABI ($Range_i$) remains insignificant for most regressions except when the specification includes the past performance relative to the PPB and the trend to outsource the fund's ABI sector. In these cases, the coefficient is positive and the marginal effect at the mean is approximately 0.6%. This is also contrary to the hypothesis that the more a provider specializes in an investment style the less likely outsourcing is. Maybe, the 'capacity limits' argument by Chen et al. (2006) applies here in a different way. Instead of outsourcing more the more types of funds a provider offers, there are capacity limits to how many funds of the same type can be run internally.

The results for all three trend proxies are very consistent across all regressions and suggest that the trend to outsource has a significantly positive effect on the probability of further outsourcing. Moreover, the market's trend to outsource is more significant than the provider's trend to outsource. Where both are significant, the marginal effect of the market's trend is larger in most cases. This implies that the general momentum to outsource in the personal pension fund industry may be more important for the decision to outsource than the provider's management choices. This may happen because providers are influenced by the practices of their peers and are more likely to outsource if many others have done so. Although the marginal effects at the means are relatively low (ranging from 0.3% to 0.8%) the positive effect on the probability of outsourcing is very robust.

Overall, the past performance has the strongest effect on the probability to outsource. Relative size is also important but the economies-of-scale argument seems to apply more to the relative size of individual investment styles. The provider's origin and bear market conditions have no effect on the decision to outsource. Finally, the general trend to outsource is important and there is indication the management practices of peers carry more weight than the provider's own outsourcing habits.

Table 5.5. Regression results with the proxies of the long-term trend of outsourcing. The dependent variable is binary and equals one if the new fund is outsourced. The estimation is done with Probit and the cross-sections are clustered by provider. The results are sorted by the period over which past performance and the bear market dummy are calculated, and by the measure of past performance. The estimated coefficients are in bold, the marginal effects are in italic, and the p-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Trend | $Trend$ and $Pr\_Trend$ | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Period | 12 months | | | | 12-24 months | | | | 24 months | | | |
| Performance | Return | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Return | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Return | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.5323*** | **-0.5289*** | **-0.9192**** | **-0.8639*** | **-0.6305** | **-0.5929** | **-0.9576*** | **-0.9282*** | **-0.6353*** | **-0.5885** | **-0.8823*** | **-0.8617*** |
| | (0.091) | (0.083) | (0.045) | (0.077) | (0.103) | (0.114) | (0.090) | (0.088) | (0.095) | (0.108) | (0.067) | (0.096) |
| $dPerformance_{i,t}$ | **-0.0919** | **-0.8813***** | | | **-0.2097** | **-0.8500**** | | | **-0.3746*** | **-1.4569**** | | |
| *margin* | *-0.0229* | *-0.2189**** | | | *-0.0505* | *-0.2046*** | | | *-0.0895** | *-0.3484*** | | |
| | (0.466) | (0.009) | | | (0.105) | (0.016) | | | (0.087) | (0.012) | | |
| $Performance^{in}_{i,t}$ | | | **0.0934***** | **0.0478** | | | **-0.1451** | **0.0477** | | | **0.0052** | **0.1003** |
| *margin* | | | *0.0237**** | *0.0122* | | | *-0.0358* | *0.0118* | | | *0.0013* | *0.0246* |
| | | | (0.008) | (0.487) | | | (0.227) | (0.707) | | | (0.937) | (0.367) |
| $Performance^{ex}_{i,t}$ | | | **0.3195**** | **0.2215** | | | **0.0682** | **0.2233**** | | | **0.4510** | **0.4903**** |
| *margin* | | | *0.0813*** | *0.0566* | | | *0.0168* | *0.0551*** | | | *0.1107* | *0.1200*** |
| | | | (0.014) | (0.253) | | | (0.634) | (0.017) | | | (0.127) | (0.045) |
| $Share_i$ | **0.0544** | **0.0462** | **0.1310*** | **0.1290*** | **0.0369** | **0.0272** | **0.1252*** | **0.1163** | **0.0469** | **0.0345** | **0.1246*** | **0.1260*** |
| *margin* | *0.0135* | *0.0115* | *0.0333** | *0.0330** | *0.0089* | *0.0066* | *0.0309** | *0.0287* | *0.0112* | *0.0082* | *0.0306** | *0.0308** |
| | (0.323) | (0.378) | (0.073) | (0.074) | (0.512) | (0.604) | (0.077) | (0.108) | (0.401) | (0.492) | (0.080) | (0.083) |
| $Share\_ABI_i$ | **-0.0487**** | **-0.0457**** | **-0.0947***** | **-0.0934***** | **-0.0482**** | **-0.0439**** | **-0.0988***** | **-0.0975***** | **-0.0483**** | **-0.0442**** | **-0.0975***** | **-0.0969***** |
| *margin* | *-0.0121*** | *-0.0114*** | *-0.0241**** | *-0.0239**** | *-0.0116*** | *-0.0106*** | *-0.0244**** | *-0.0241**** | *-0.0115*** | *-0.0106*** | *-0.0239**** | *-0.0237**** |
| | (0.038) | (0.030) | (0.000) | (0.000) | (0.036) | (0.029) | (0.000) | (0.000) | (0.042) | (0.022) | (0.000) | (0.000) |
| $Range_i$ | **0.0030** | **0.0012** | **0.0108** | **0.0104** | **0.0033** | **0.0025** | **0.0101** | **0.0098** | **0.0034** | **0.0016** | **0.0086** | **0.0089** |
| *margin* | *0.0008* | *0.0003* | *0.0027* | *0.0027* | *0.0008* | *0.0006* | *0.0025* | *0.0024* | *0.0008* | *0.0004* | *0.0021* | *0.0022* |
| | (0.706) | (0.873) | (0.341) | (0.368) | (0.715) | (0.762) | (0.377) | (0.409) | (0.716) | (0.843) | (0.444) | (0.444) |
| $Prov\_nonUK_i$ | **0.0839** | **0.0843** | **0.2192** | **0.2308** | **0.0874** | **0.0662** | **0.1857** | **0.1793** | **0.0631** | **0.0423** | **0.1531** | **0.1707** |
| *margin* | *0.0209* | *0.0210* | *0.0550* | *0.0582* | *0.0211* | *0.0160* | *0.0453* | *0.0437* | *0.0151* | *0.0101* | *0.0372* | *0.0413* |
| | (0.655) | (0.651) | (0.254) | (0.230) | (0.661) | (0.734) | (0.361) | (0.391) | (0.759) | (0.835) | (0.451) | (0.442) |
| $Bear_t$ | **0.0121** | **0.0197** | **0.0229** | **-0.0249** | **-0.0445** | **-0.0505** | **0.0976** | **0.1217** | **0.0698** | **0.0634** | **0.0170** | **-0.0102** |
| *margin* | *0.0030* | *0.0049* | *0.0058* | *-0.0064* | *-0.0108* | *-0.0123* | *0.0235* | *0.0291* | *0.0165* | *0.0150* | *0.0042* | *-0.0025* |
| | (0.938) | (0.898) | (0.919) | (0.911) | (0.731) | (0.689) | (0.615) | (0.520) | (0.641) | (0.668) | (0.936) | (0.959) |
| $Trend$ | **0.0162***** | **0.0170***** | **0.0307**** | **0.0313**** | **0.0202***** | **0.0200***** | **0.0347**** | **0.0339**** | **0.0190***** | **0.0193***** | **0.0307**** | **0.0311**** |
| *margin* | *0.0040**** | *0.0042**** | *0.0078*** | *0.0080*** | *0.0049**** | *0.0048**** | *0.0086*** | *0.0084*** | *0.0045**** | *0.0046**** | *0.0075*** | *0.0076*** |
| | (0.003) | (0.001) | (0.018) | (0.019) | (0.002) | (0.002) | (0.014) | (0.014) | (0.001) | (0.001) | (0.014) | (0.019) |
| $Pr\_Trend$ | **0.0140***** | **0.0140***** | **0.0040** | **0.0032** | **0.0149***** | **0.0152***** | **0.0051** | **0.0050** | **0.0145***** | **0.0147***** | **0.0059** | **0.0050** |
| *margin* | *0.0035**** | *0.0035**** | *0.0010* | *0.0008* | *0.0036**** | *0.0037**** | *0.0013* | *0.0012* | *0.0035**** | *0.0035**** | *0.0014* | *0.0012* |
| | (0.005) | (0.005) | (0.615) | (0.700) | (0.005) | (0.004) | (0.547) | (0.557) | (0.008) | (0.007) | (0.490) | (0.576) |
| Pseudo $R^2$ | 0.1407 | 0.1441 | 0.1762 | 0.1702 | 0.1604 | 0.1620 | 0.1933 | 0.1954 | 0.1581 | 0.1601 | 0.1920 | 0.1930 |
| $Chi^2$ | 103.4432 | 106.6721 | 160.7762 | 113.2020 | 98.5432 | 122.4767 | 347.2339 | 193.6712 | 74.5903 | 84.9135 | 213.1324 | 212.1613 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Observations | 3725 | 3725 | 1702 | 1702 | 3476 | 3476 | 1577 | 1577 | 3464 | 3464 | 1571 | 1571 |

Table 5.6. Regression results with the proxies of the long-term trend of the ABI sector's outsourcing. The dependent variable is binary and equals one if the new fund is outsourced. The estimation is done with Probit and the cross-sections are clustered by provider. The results are sorted by the period over which past performance and the bear market dummy are calculated, and by the measure of past performance. The estimated coefficients are in bold, the marginal effects are in italic, and the p-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Trend | $ABItrend$ and $Pr\_ABItrend$ | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Period | 12 months | | | | 12-24 months | | | | 24 months | | | |
| Performance | Return | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Return | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Return | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.7141**** | **-0.6997**** | **-1.0649**** | **-1.0223**** | **-0.7569**** | **-0.7343**** | **-1.0779*** | **-1.0350*** | **-0.7487**** | **-0.7229**** | **-0.9922**** | **-0.9933*** |
| | (0.019) | (0.018) | (0.015) | (0.027) | (0.033) | (0.035) | (0.067) | (0.061) | (0.034) | (0.038) | (0.043) | (0.056) |
| $dPerformance_{i,t}$ | **-0.0801** | **-0.6191*** | | | **-0.0921** | **-0.5242*** | | | **-0.2369** | **-0.9923*** | | |
| *margin* | *-0.0197* | *-0.1521** | | | *-0.0220* | *-0.1249** | | | *-0.0561* | *-0.2350** | | |
| | (0.500) | (0.083) | | | (0.432) | (0.088) | | | (0.229) | (0.058) | | |
| $Performance_{i,t}^{in}$ | | | **0.0727***** | **-0.0165** | | | **-0.1617** | **0.0269** | | | **-0.0188** | **0.0821** |
| *margin* | | | *0.0184**** | *-0.0042* | | | *-0.0402* | *0.0067* | | | *-0.0046* | *0.0202* |
| | | | (0.006) | (0.830) | | | (0.120) | (0.815) | | | (0.790) | (0.543) |
| $Performance_{i,t}^{ex}$ | | | **0.3559***** | **0.2841** | | | **0.0391** | **0.2392**** | | | **0.4291** | **0.5519**** |
| *margin* | | | *0.0902**** | *0.0725* | | | *0.0097* | *0.0595*** | | | *0.1060* | *0.1358*** |
| | | | (0.005) | (0.126) | | | (0.803) | (0.029) | | | (0.157) | (0.023) |
| $Share_i$ | **0.0559** | **0.0513** | **0.1458**** | **0.1447**** | **0.0442** | **0.0377** | **0.1519**** | **0.1393**** | **0.0509** | **0.0437** | **0.1469**** | **0.1457**** |
| *margin* | *0.0137* | *0.0126* | *0.0370*** | *0.0369*** | *0.0105* | *0.0090* | *0.0378*** | *0.0346*** | *0.0121* | *0.0103* | *0.0363*** | *0.0359*** |
| | (0.273) | (0.298) | (0.036) | (0.034) | (0.407) | (0.463) | (0.022) | (0.043) | (0.326) | (0.371) | (0.029) | (0.036) |
| $Share\_ABI_i$ | **-0.0463**** | **-0.0446***** | **-0.0967***** | **-0.0966***** | **-0.0471**** | **-0.0437**** | **-0.1031***** | **-0.1004***** | **-0.0466**** | **-0.0437***** | **-0.0984***** | **-0.0976***** |
| *margin* | *-0.0114*** | *-0.0110**** | *-0.0245**** | *-0.0246**** | *-0.0112*** | *-0.0104*** | *-0.0256**** | *-0.0250**** | *-0.0110*** | *-0.0103**** | *-0.0243**** | *-0.0240**** |
| | (0.015) | (0.009) | (0.000) | (0.000) | (0.015) | (0.012) | (0.000) | (0.000) | (0.015) | (0.007) | (0.000) | (0.000) |
| $Range_i$ | **0.0086** | **0.0071** | **0.0237**** | **0.0237**** | **0.0101** | **0.0091** | **0.0247**** | **0.0235**** | **0.0092** | **0.0079** | **0.0211*** | **0.0216**** |
| *margin* | *0.0021* | *0.0018* | *0.0060*** | *0.0061*** | *0.0024* | *0.0022* | *0.0061*** | *0.0059*** | *0.0022* | *0.0019* | *0.0052** | *0.0053*** |
| | (0.273) | (0.317) | (0.023) | (0.023) | (0.251) | (0.260) | (0.036) | (0.047) | (0.292) | (0.296) | (0.050) | (0.046) |
| $Prov\_nonUK_i$ | **0.1189** | **0.1240** | **0.2428** | **0.2688** | **0.1514** | **0.1442** | **0.2729** | **0.2575** | **0.1224** | **0.1164** | **0.2267** | **0.2320** |
| *margin* | *0.0293* | *0.0306* | *0.0606* | *0.0675* | *0.0362* | *0.0345* | *0.0666* | *0.0629* | *0.0291* | *0.0277* | *0.0552* | *0.0562* |
| | (0.468) | (0.447) | (0.167) | (0.113) | (0.326) | (0.344) | (0.113) | (0.142) | (0.442) | (0.466) | (0.186) | (0.229) |
| $Bear_t$ | **0.0054** | **0.0103** | **0.0465** | **-0.0100** | **-0.0852** | **-0.0862** | **0.0750** | **0.0957** | **0.0461** | **0.0432** | **0.0424** | **0.0124** |
| *margin* | *0.0013* | *0.0025* | *0.0117* | *-0.0026* | *-0.0207* | *-0.0210* | *0.0183* | *0.0232* | *0.0108* | *0.0102* | *0.0104* | *0.0030* |
| | (0.975) | (0.952) | (0.836) | (0.964) | (0.500) | (0.489) | (0.699) | (0.605) | (0.761) | (0.776) | (0.841) | (0.949) |
| $ABItrend$ | **0.0133***** | **0.0136***** | **0.0214**** | **0.0226***** | **0.0159***** | **0.0160***** | **0.0252**** | **0.0243**** | **0.0151***** | **0.0155***** | **0.0221**** | **0.0221**** |
| *margin* | *0.0033**** | *0.0034**** | *0.0054*** | *0.0058**** | *0.0038**** | *0.0038**** | *0.0063*** | *0.0060*** | *0.0036**** | *0.0037**** | *0.0055*** | *0.0055*** |
| | (0.000) | (0.000) | (0.010) | (0.009) | (0.000) | (0.000) | (0.011) | (0.010) | (0.000) | (0.000) | (0.011) | (0.015) |
| $Pr\_ABItrend$ | **0.0150***** | **0.0148***** | **0.0062** | **0.0050** | **0.0150***** | **0.0150***** | **0.0049** | **0.0050** | **0.0146***** | **0.0145***** | **0.0055** | **0.0053** |
| *margin* | *0.0037**** | *0.0036**** | *0.0016* | *0.0013* | *0.0036**** | *0.0036**** | *0.0012* | *0.0012* | *0.0035**** | *0.0034**** | *0.0014* | *0.0013* |
| | (0.000) | (0.000) | (0.204) | (0.311) | (0.000) | (0.000) | (0.391) | (0.374) | (0.000) | (0.000) | (0.334) | (0.373) |
| Pseudo $R^2$ | 0.1586 | 0.1602 | 0.1777 | 0.1721 | 0.1736 | 0.1748 | 0.1877 | 0.1896 | 0.1703 | 0.1716 | 0.1854 | 0.1879 |
| $Chi^2$ | 230.2885 | 231.0557 | 251.7181 | 158.8550 | 252.7661 | 312.9252 | 343.4701 | 254.6276 | 189.2147 | 220.8811 | 241.1041 | 199.1381 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Observations | 3725 | 3725 | 1702 | 1702 | 3476 | 3476 | 1577 | 1577 | 3464 | 3464 | 1571 | 1571 |

Table 5.7. Regression results with the proxies of the short-term trend of outsourcing. The dependent variable is binary and equals one if the new fund is outsourced. The estimation is done with Probit and the cross-sections are clustered by provider. The results are sorted by the period over which past performance and the bear market dummy are calculated, and by the measure of past performance. The estimated coefficients are in bold, the marginal effects are in italic, and the p-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Trend | $Propensity_t$ and $Pr\_Propensity_t$ | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Period | 12 months | | | | 12-24 months | | | | 24 months | | | |
| Performance | Return | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Return | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Return | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.7369*** ** | **-0.7323*** ** | **-1.3131*** | **-1.2384*** | **-0.5338** | **-0.4982** | **-1.2370** ** | **-1.1564** ** | **-1.0675*** ** | **-1.0286*** ** | **-1.5260*** ** | **-1.5464*** ** |
| | (0.009) | (0.007) | (0.063) | (0.082) | (0.124) | (0.147) | (0.038) | (0.041) | (0.000) | (0.000) | (0.001) | (0.002) |
| $\boldsymbol{dPerformance_{i,t}}$ | **-0.0698** | **-0.8649*** | | | **-0.2114** | **-0.6819*** | | | **-0.3414** | **-1.2910** ** | | |
| *margin* | *-0.0169* | *-0.2094** | | | *-0.0518* | *-0.1671** | | | *-0.0819* | *-0.3106** * | | |
| | (0.602) | (0.060) | | | (0.177) | (0.085) | | | (0.141) | (0.033) | | |
| $\boldsymbol{Performance^{in}_{i,t}}$ | | | **0.1250*** ** | **0.0233** | | | **-0.1841*** | **-0.0227** | | | **0.0232** | **0.1004** |
| *margin* | | | *0.0309*** * | *0.0058* | | | *-0.0454** | *-0.0056* | | | *0.0057* | *0.0244* |
| | | | (0.003) | (0.770) | | | (0.086) | (0.873) | | | (0.732) | (0.406) |
| $\boldsymbol{Performance^{ex}_{i,t}}$ | | | **0.2925** ** | **0.1331** | | | **0.0024** | **0.1971** | | | **0.4983** ** | **0.6425*** ** |
| *margin* | | | *0.0724** * | *0.0333* | | | *0.0006* | *0.0487* | | | *0.1217** * | *0.1562*** * |
| | | | (0.032) | (0.437) | | | (0.988) | (0.106) | | | (0.029) | (0.003) |
| $\boldsymbol{Share_i}$ | **0.0909*** | **0.0832*** | **0.1700** ** | **0.1656** ** | **0.0685** | **0.0624** | **0.1523** ** | **0.1400** ** | **0.0793*** | **0.0690*** | **0.1305** ** | **0.1290** ** |
| *margin* | *0.0221** | *0.0201** | *0.0421** * | *0.0415** * | *0.0168* | *0.0153* | *0.0375** * | *0.0346** * | *0.0190** | *0.0166** | *0.0319** * | *0.0314** * |
| | (0.091) | (0.100) | (0.021) | (0.020) | (0.208) | (0.231) | (0.025) | (0.040) | (0.081) | (0.087) | (0.027) | (0.034) |
| $\boldsymbol{Share\_ABI_i}$ | **-0.0405** | **-0.0373*** | **-0.0932*** ** | **-0.0936*** ** | **-0.0445** ** | **-0.0415** ** | **-0.0946*** ** | **-0.0926*** ** | **-0.0392*** | **-0.0355** ** | **-0.0849*** ** | **-0.0841*** ** |
| *margin* | *-0.0098* | *-0.0090** | *-0.0231*** * | *-0.0234*** * | *-0.0109** * | *-0.0102** * | *-0.0233*** * | *-0.0229*** * | *-0.0094** | *-0.0085** * | *-0.0207*** * | *-0.0204*** * |
| | (0.107) | (0.095) | (0.000) | (0.000) | (0.048) | (0.041) | (0.000) | (0.000) | (0.077) | (0.045) | (0.000) | (0.000) |
| $\boldsymbol{Range_i}$ | **-0.0031** | **-0.0050** | **0.0075** | **0.0074** | **-0.0000** | **-0.0005** | **0.0111** | **0.0106** | **0.0071** | **0.0053** | **0.0134** | **0.0137** |
| *margin* | *-0.0007* | *-0.0012* | *0.0019* | *0.0018* | *-0.0000* | *-0.0001* | *0.0027* | *0.0026* | *0.0017* | *0.0013* | *0.0033* | *0.0033* |
| | (0.739) | (0.537) | (0.476) | (0.472) | (0.999) | (0.959) | (0.349) | (0.391) | (0.420) | (0.475) | (0.162) | (0.170) |
| $\boldsymbol{Prov\_nonUK_i}$ | **0.0156** | **0.0181** | **0.0362** | **0.0357** | **0.2649** | **0.2550** | **0.1837** | **0.1701** | **0.0399** | **0.0268** | **0.0279** | **0.0387** |
| *margin* | *0.0038* | *0.0044* | *0.0089* | *0.0089* | *0.0655* | *0.0631* | *0.0447* | *0.0416* | *0.0096* | *0.0064* | *0.0068* | *0.0094* |
| | (0.919) | (0.904) | (0.827) | (0.814) | (0.231) | (0.249) | (0.270) | (0.322) | (0.788) | (0.857) | (0.813) | (0.771) |
| $\boldsymbol{Bear_t}$ | **0.0513** | **0.0683** | **0.0654** | **0.0148** | **-0.0440** | **-0.0517** | **-0.0065** | **0.0138** | **0.1359** | **0.1299** | **0.0330** | **-0.0091** |
| *margin* | *0.0124* | *0.0164* | *0.0161* | *0.0037* | *-0.0109* | *-0.0128* | *-0.0016* | *0.0034* | *0.0320* | *0.0307* | *0.0080* | *-0.0022* |
| | (0.650) | (0.552) | (0.702) | (0.932) | (0.738) | (0.692) | (0.970) | (0.932) | (0.320) | (0.340) | (0.869) | (0.960) |
| $\boldsymbol{Propensity_t}$ | **0.0110*** ** | **0.0113*** ** | **0.0189** ** | **0.0190** ** | **0.0138*** ** | **0.0137*** ** | **0.0232*** ** | **0.0221** ** | **0.0085** ** | **0.0087** ** | **0.0153** ** | **0.0161** ** |
| *margin* | *0.0027*** * | *0.0027*** * | *0.0047** * | *0.0048** * | *0.0034*** * | *0.0034*** * | *0.0057*** * | *0.0055** * | *0.0020** * | *0.0021** * | *0.0037** * | *0.0039** * |
| | (0.001) | (0.001) | (0.034) | (0.031) | (0.007) | (0.007) | (0.009) | (0.010) | (0.018) | (0.016) | (0.048) | (0.038) |
| $\boldsymbol{Pr\_Propensity_t}$ | **0.0098*** ** | **0.0098*** ** | **0.0057** ** | **0.0056** ** | **0.0051** | **0.0051** | **0.0037** | **0.0036** | **0.0152*** ** | **0.0153*** ** | **0.0135*** ** | **0.0129*** ** |
| *margin* | *0.0024*** * | *0.0024*** * | *0.0014** * | *0.0014** * | *0.0013* | *0.0013* | *0.0009* | *0.0009* | *0.0036*** * | *0.0037*** * | *0.0033*** * | *0.0031*** * |
| | (0.000) | (0.000) | (0.018) | (0.016) | (0.181) | (0.173) | (0.380) | (0.393) | (0.000) | (0.000) | (0.000) | (0.001) |
| Pseudo $R^2$ | 0.1526 | 0.1561 | 0.1793 | 0.1707 | 0.1427 | 0.1427 | 0.2041 | 0.2034 | 0.1721 | 0.1735 | 0.2058 | 0.2092 |
| $Chi^2$ | 253.1249 | 256.2933 | 235.6933 | 150.1387 | 74.4713 | 80.1649 | 306.6645 | 238.8103 | 253.3957 | 341.4762 | 365.8982 | 347.8486 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Observations | 3521 | 3521 | 1655 | 1655 | 3303 | 3303 | 1547 | 1547 | 3332 | 3332 | 1562 | 1562 |

## 5.4. Discussion

The objective of this chapter was to examine potential factors determining a decision to outsource, and, in particular, whether the past scale of outsourcing impacts on the current decision to outsource. Previous research has identified a series of factors associated with decisions to outsource but has neglected the importance of 'fashion to outsource'. This chapter makes a first step in filling this gap in the literature.

Different proxies were created in order to measure 'fashion to outsource' and regression analysis showed that these are significant. Furthermore, the degree of overall outsourcing in the market was found to be more important than the degree of outsourcing within each provider supporting the hypothesis that there is an "everybody is doing it" factor behind the rapid development of outsourcing in the personal pension industry in the UK.

Past performance was found to have the strongest effect on the probability to outsource. Particularly, the evidence indicates that if internally managed funds with the same investment style as the new fund have performed well in the past it is less likely that the new fund will be run externally. At the same time, the higher the past performance of externally managed funds is the higher the probability that a new fund of the same investment type will be outsourced. The latter effect seems to be the strongest of the two.

Out of the remaining explanatory variables, only the provider's relative size in the new fund's ABI sector had an effect on outsourcing which is robust across all specifications. The result implied that providers that are able to create economies of scale for a particular investment style are less likely to outsource new funds of the same style. However, further evidence indicated that this argument does not apply to the overall size of the provider suggesting that there are capacity limits within every organization.

This biggest contribution of this chapter is to confirm the importance of a factor, not related to performance, which has been used only anecdotally as a reason for any type of outsourcing in the past literature. It also adds to the literature of fund management outsourcing by showing that when providers decide whether to outsource there is at least some consideration on what competitors do. The most important limitation in this analysis is the absence of management costs due to lack of information. Previous literature showed that saving costs was one of the main determinants of outsourcing, particularly for IT services. As such, future research could include information on manager compensation, the contract arrangements for outsourced funds, etc. Moreover, it may be worthwhile to approach industry professionals and conduct a survey on what they consider to be important when making the decision to outsource. This can provide valuable insights for the related academic literature.

# CONCLUSION

This thesis had three main objectives. The first objective was to investigate the relationship between fund performance and fund's age. The second objective was to examine whether there were any differences in the performance of internally and externally managed funds. The third objective was to test whether the boom in fund management outsourcing can be in any way explained by 'fashion'.

The first objective was addressed in Chapter 3. The analysis showed that fund performance changes with fund's age but in most cases, this relationship depends on the age of the fund provider. Moreover, it emerged that although the performance of fixed income funds changes with fund's age in the way that is predicted by the chapter's main hypothesis, the performance of equity funds follows a different pattern. It is argued, however, that this pattern is not inconsistent with the premise of the hypothesis.

The second objective was addressed in Chapter 4. Both descriptive and regression analysis showed that externally managed funds outperform their benchmarks more than internally managed funds do. Nevertheless, there was indication that this difference is due to external funds having more 'flattering' benchmarks. This was also supported by the fact the risk-adjusted returns of either type are on average insignificantly different from zero. The relationship between performance and fund's age was found to be somewhat similar for both types but there was a difference in the effects of the other variables. The performance of external funds was found to be more affected by changing market conditions, and indeed there was some indication that external managers have poor timing skills relative to internal managers. Additionally, size and market share have a stronger positive effect on the performance of external funds. A possible explanation for this is that most providers are large insurance companies and have a diversified business portfolio whereas most wealth management companies focus on one business purpose and thus, economies of scale are more important for them. This may also explain why the performance of external funds is more strongly affected by changes in regulation, i.e. external managers are more attentive of any factor that may influence their business.

The third and last objective was addressed in Chapter 5. The analysis results showed that 'fashion' affects the providers' decision to outsource fund management. Although its marginal effect was relatively low, it was highly significant across all specifications. Past performance of internally and externally managed funds was found to be the strongest determinant of outsourcing.

Several results emerged from the investigation of the performance of UK personal pension funds. First, the risk-adjusted returns (Sharpe ratio) were not significantly different from zero for any investment style. However, performance relative to the PPB was on average positive and significant for all styles, which raises questions on how benchmarks are selected. Out of the three major investment types (allocation, fixed income, and equity) equity funds had the lowest PPB outperformance. Moreover, the average performance relative to the PPB of externally managed funds is generally found to be higher than that of internally managed funds, except for fixed income funds.

There were many differences between investment styles but some results appeared several times. One of the most consistent results was that fund outperformance is explained by provider size, i.e. funds operated by larger providers perform better than funds by smaller providers. However, the negative interaction between size and fund's age indicated that this difference diminishes the older a fund is. Furthermore, fund performance is explained by provider's age and the relationship tends to follow a U-shape, i.e. funds that are operated by 'middle-aged' providers underperform those operated by either very young or very old providers. Finally, the interactions between fund's age and the bear and bull market dummies implied that older funds can cope better in bearish times whereas young funds can gain more in bullish markets.

This thesis makes several contributions, mostly to fund performance literature. It gives empirical evidence of the performance of UK personal pension funds, a sector that is not met in past literature. It proposes measures of fund performance that are outside the CAPM-APT framework. More importantly, it shows that fund's age and outsourcing need to be addressed in more detail when fund performance is discussed.

There are also contributions outside the academic sphere. The results show that these funds don't have significant risk-adjusted returns although they appear to outperform their benchmarks. This raises the questions for regulators and contributors of how benchmarks are used in the marketing of the funds. The same question applies to management outsourcing. Neither internal nor external funds have significant risk-adjusted returns but external funds outperform their PPBs more. Descriptive analysis indicates that may be due to more favourable benchmark selection so that performance statistics presented for marketing purposes may be misleading.

# APPENDIX

## A. Entry year, name, and total number of funds of personal pension providers (Chapter 2)

Shows the names of the institutions offering personal pensions in the UK. It includes the total number of personal pension funds offered by each institution as well as their entry year. The latter relates to the year when each institution incepted for the first time a personal pension fund in the UK. All information as of end 2009. *Source: Own calculations using Morningstar Direct*[TM] *data.*

| Entry Year | Pension Provider and Number of Total Funds | | | Entry Year | Pension Provider and Number of Total Funds | |
|---|---|---|---|---|---|---|
| 1971 | Abbey Life Assurance | 103 | | 1983 | MGM Assurance | 40 |
| 1983 | AEGON | 470 | | 1996 | Nationwide Life | 2 |
| 1994 | Alico | 443 | | 1992 | NatWest Life Assurance | 27 |
| 1972 | Aviva | 990 | | 1988 | NFU Mutual Unit Managers | 34 |
| 1979 | AXA | 769 | | 1982 | NPI National Provident Institution | 210 |
| 1977 | Barclays Life | 24 | | 1980 | Pearl Assurance | 8 |
| 1989 | BlackRock | 139 | | 1969 | Phoenix Life Assurance | 274 |
| 1975 | Canada Life | 282 | | 1968 | Prudential | 470 |
| 1971 | Century Life | 68 | | 2006 | Reassure UK Life Assurance Company | 7 |
| 1979 | City of Westminster Assurance | 7 | | 1984 | Reliance Mutual | 47 |
| 1982 | Clerical Medical | 178 | | 1987 | Royal Liver Assurance | 15 |
| 2005 | Co-operative Insurance Society | 50 | | 1986 | Royal London Asset Management | 15 |
| 1984 | Countrywide Assured | 10 | | 1990 | Royal Scottish Assurance | 12 |
| 1984 | Equitable Life Assurance Society | 35 | | 1972 | Save & Prosper Group | 9 |
| 1989 | Family Investments | 2 | | 1998 | Scottish Friendly Assurance | 6 |
| 1995 | Forester Life | 1 | | 1984 | Scottish Life | 107 |
| 1971 | Friends Provident Life and Pensions | 465 | | 1985 | Scottish Mutual Assurance | 82 |
| 1985 | Generali | 7 | | 1981 | Scottish Widows Group | 531 |
| 1986 | GT Plan | 2 | | 1979 | Skandia Life Assurance | 1168 |
| 1980 | Guardian Insurance and Annuity | 26 | | 1991 | St James Place Group | 62 |
| 1984 | Halifax Life | 92 | | 1980 | Standard Life | 600 |
| 1990 | HSBC Life | 18 | | 1973 | Sun Life of Canada | 53 |
| 1997 | Invesco | 36 | | 1989 | Swiss Life Holding | 8 |
| 1981 | Irish Life | 13 | | 1987 | Teachers Assurance | 2 |
| 1977 | Legal & General | 690 | | 1987 | The Chidren's Mutual | 2 |
| 1977 | Lincoln Financial Group | 164 | | 2007 | The Hartford | 113 |
| 2003 | Liverpool Victoria Friendly Society | 203 | | 1985 | United Friendly Insurance | 20 |
| 1981 | London Life Insurance Company | 14 | | 1988 | Wesleyan Assurance | 9 |
| 1995 | Marks & Spencer Life Assurance | 4 | | 1977 | Windsor Life | 770 |
| 1993 | Medical Sickness Annuity and Life | 7 | | 1984 | Winterthur | 968 |
| 1972 | Merchant Investors | 456 | | 1974 | Zurich | 757 |
| 2007 | MetLife | 111 | | | **TOTAL** | **12307** |

## B. Investment Style Classification (Chapter 2)

The Association of British Insurers (ABI) uses a sector classification system for life and pension funds based on their observed investment strategy. This is meant to assist investors and advisers to compare similar funds. The Morningstar database includes this information for the UK pension funds under the variable "ABI pension sector". Additionally, they report a separate variable "specialist sector" which also conveys the investment profile of a fund. The combination of the two variables enables the identification of the dominant investment strategies. Using the ABI and Morningstar classifications funds can be summarized into the following - mutually exclusive - broad investment sectors:

i. Allocation
It includes all funds that belong to these ABI sectors: Balanced, Cautious, Defensive, and Flexible. Where ABI sector is "Unclassified" or not available, funds with the words "asset allocation" in the Morningstar "Specialist Sector" variable are also classified within this group.

ii. Equity
It includes all funds that belong to the se ABI sectors: Asia Pacific excl. Japan, Asia Pacific incl. Japan, Europe excl. UK, Europe incl. UK, Global Equities, Global Emerging Markets Equities, North America, UK All Companies, UK Smaller Companies, UK Equity Income. Where ABI sector is "Unclassified" or not available, funds with the word "equity" in the Morningstar "Specialist Sector" variable are also classified within this group.

iii. Fixed Income
It includes all funds that belong to the following ABI sectors: Global Fixed Interest, Global High Yield, Sterling Fixed Interest, Sterling Long Bond, Sterling Corporate Bond, UK Index-Linked Gilts, UK gilt. Where ABI sector is "Unclassified" or not available, funds with the words "fixed interest" in the Morningstar "Specialist Sector" variable are also classified within this group.

iv. Money Market
It includes all funds that belong to the ABI sector: Money Market. Where ABI sector is "Unclassified" or not available, funds with the words "money market" in the Morningstar "Specialist Sector" variable are also classified within this group.

v. Protected
It includes all funds that belong to the ABI sector: Protected/Guaranteed.

vi. Real Estate
It includes all funds that belong to these ABI sectors: Global Property, UK Direct Property, and UK Property Securities. Where ABI sector is "Unclassified" or not available, funds with the words "real estate" in the Morningstar "Specialist Sector" variable are also classified within this group.

vii. Specialist
It includes all funds that belong to the ABI sector: Specialist.

viii. Unclassified
It includes all funds that belong to the ABI sector: Unclassified, for which no additional information is given by Morningstar.

The ABI and Morningstar definitions for investment style allow a more detailed classification. Using asset allocation limits for allocation funds and geographical focus for the other types, the broad investment sectors are divided into the following - mutually exclusive - narrow investment sectors:

i. Allocation 100
It includes all funds that belong to the ABI "Allocation Flexible" sector. This sector allows for up to 100% allocation in equity.

ii. Allocation 85
It includes all funds that belong to the ABI "Allocation Balanced" sector. This sector allows for up to 85% allocation in equity.

iii. Allocation 60
It includes all funds that belong to the ABI "Allocation Cautious" sector. This sector allows for up to 60% allocation in equity.

iv. Allocation 35
It includes all funds that belong to the ABI "Allocation Defensive" sector. This sector allows for up to 35% allocation in equity.

v. Equity emerging
It includes all funds that belong to the ABI sector "Emerging Markets Equities".

vi. Equity international
It includes all funds that belong to these ABI sectors: Asia Pacific excl. Japan, Asia Pacific incl. Japan, Europe excl. UK, Europe incl. UK, Global Equities, Global Emerging Markets Equities, North America.

vii. Equity UK
It includes all funds that belong to these ABI sectors: UK All Companies, UK Smaller Companies, UK Equity Income.

viii. Fixed income international
It includes all funds that belong to these ABI sectors: Global Fixed Interest, Global High Yield.

ix. Fixed income UK
It includes all funds that belong to these ABI sectors: Sterling Fixed Interest, Sterling Long Bond, Sterling Corporate Bond, UK Index-Linked Gilts, UK gilt.

x. Real estate international
It includes all funds that belong to the ABI sector "Global Property".

xi. Real estate UK
It includes all funds that belong to these ABI sectors: UK Direct Property, UK Property Securities.

## ABI Sector Definition[40]

| ABI Sectors | Category | ABI Definition |
|---|---|---|
| Asia Pacific excl. Japan Equities | Equity | Funds which invest at least 80% of their assets in Asia Pacific equities, but which normally hold no equities quoted on the Japanese stock market; Asia Pacific includes all countries in the FTSE World Asia Pacific Index. |
| Asia Pacific incl. Japan Equities | Equity | Funds which invest at least 80% of their assets in Asia Pacific equities and which include Japanese equities; Asia Pacific includes all countries in the FTSE World Asia Pacific index; not to include funds which would otherwise qualify for the Japan Equity sector. |
| Balanced (up to 85% Equity) Managed | Allocation | Maximum of 85% total equity (including Preference Shares, Permanent Interest Bearing Shares and Convertibles); minimum of 40% total equity; minimum of 50% Sterling based assets (including fixed interest hedged back to Sterling); fixed interest defined as Government Sovereign Bonds and Corporate Bonds. |
| Cautious (up to 60% Equity) Managed | Allocation | Maximum of 60% total equity (including Preference Shares, Permanent Interest Bearing Shares and Convertibles); minimum of 20% total equity; minimum of 60% Sterling based assets (including fixed interest hedged back to Sterling; fixed interest defined as Government Sovereign Bonds and Corporate Bonds. |
| Commodity/Energy | Equity | Funds that invest at least 80% of their assets in commodity and/or energy related securities (Precious Metals; Other Metals; Energy; and Materials) |
| Defensive (up to 35% Equity) Managed | Allocation | Maximum of 35% total equity (including Preference Shares, Permanent Interest Bearing Shares and Convertibles); No minimum equity requirement but managers' stated intention retains the right to invest in equities; minimum of 85% Sterling based assets (including fixed interest hedged back to Sterling; fixed interest defined as Government Sovereign Bonds and Corporate Bonds. |
| Europe excl. UK Equities | Equity | Funds which invest at least 80% of their assets in equities quoted on European stock markets, but which normally hold no equities quoted on the UK stock market; Europe includes all countries in the FTSE World Europe/MSCI Europe indices. |
| Europe incl. UK Equities | Equity | Funds which invest at least 80% of their assets in equities quoted on UK and European stock markets; not to include funds which would otherwise qualify for a UK equity sector; Europe includes all countries in the FTSE World Europe/MSCI Europe indices. |
| Flexible (up to 100% Equity) Managed | Allocation | Maximum of 100% total equity (including Preference Shares, Permanent Interest Bearing Shares and Convertibles); no minimum equity requirement but manager's stated intention retains the right to invest up to 100% in equities; minimum of 20% Sterling based assets (including fixed interest hedged back to Sterling). |

[40] Source: Association of British Insurers (www.abi.org.uk).

| | | |
|---|---|---|
| Global Emerging Markets Equities | Equity | Funds which invest at least 80% of their assets in equities from emerging markets, as defined by the FTSE World Index Indices, without geographical restriction; funds with more than 50% of assets in any one geographical region or theme, e.g. China, India, Latin America or BRIC will also be flagged on fund data provider platforms. |
| Global Equities | Equity | Funds which invest at least 80% of their assets in equities; funds must be invested in more than one equity region; not to include funds which would otherwise qualify for the Global Emerging Markets Equity sector. |
| Global Fixed Interest | Fixed Interest | Funds which invest at least 80% of their assets in non-UK broad investment grade fixed interest securities. Fixed interest defined as Government Sovereign Bonds and Corporate Bonds. |
| Global High Yield | Fixed Interest | Funds which invest at least 80% of their assets in non-UK fixed interest securities. Funds which invest at least 50% of their assets in subinvestment grade fixed interest securities. Fixed interest defined as Government Sovereign Bonds and Corporate Bonds. |
| Global Property | Real Estate | Funds that invest at least 80% of their assets in direct property and property securities. Minimum 50% non-UK assets. |
| Japan Equities | Equity | Funds which invest at least 80% of their assets in equities quoted on the Japanese stock market. |
| Money Market | Money Market | Funds which invest at least 95% of their assets in sterling (or hedged back to sterling) money market instruments. Money market instruments are defined as cash and near cash, such as bank deposits, certificates of deposit, and fixed interest securities within three months of maturity or floating rate notes. |
| North America | Equity | Funds which invest at least 80% of their assets in equities quoted on United States and Canadian stock markets. |
| Protected/Guaranteed Funds | Protected | Funds, other than money market funds, which principally aim to provide a return of a set amount of capital back to the investor (either explicitly guaranteed or via an investment strategy highly likely to achieve this objective) plus some market upside. |
| Specialist | Specialist | Funds that have an investment universe that is not accommodated by the mainstream sectors. Performance ranking of funds within the sector as a whole is inappropriate, given the diverse nature of its constituents. As there are no parameters for funds in the Specialist Sector, funds should not be compared on a like-for-like basis. |
| Sterling Corporate Bond | Fixed Interest | Funds which invest at least 80% of their assets in sterling denominated (or hedged back to sterling) broad investment grade corporate bond securities. This excludes Preference Shares, Permanent Interest Bearing Shares and Convertible Securities. Broad Investment Grade is defined as (or equivalent to) BBB minus or above as measured by Standard & Poor’s and by Fitch and Baa or above as measured by Moody’s. |
| Sterling Fixed Interest | Fixed Interest | Funds which invest at least 80% of their assets in sterling-denominated (or hedged back to sterling) broad investment grade fixed interest securities; fixed interest defined as Government Sovereign Bonds and Corporate Bonds; Preference Shares, Permanent Interest Bearing Shares and Convertibles are not treated as fixed interest payments. |
| Sterling High Yield | Fixed Interest | Funds which invest at least 80% of their assets in sterling denominated (or hedged back to sterling) fixed interest securities. Funds which invest at least 50% of their assets in sub investment grade fixed interest securities. |
| Sterling Long Bond | Fixed Interest | Funds (used in conjunction with pension plans) with a specific objective for the movement in the value of units in the fund to approximate to movements in annuity purchase prices. Funds which invest at least 80% |

| | | |
|---|---|---|
| | | of their assets in sterling denominated (or hedged back to sterling) long duration (10 years or more) broad investment grade fixed interest securities. N.B. Duration requirements for the Sterling Long Bond Sector reflect the likely interest rate risk affecting funds, with the specific additional requirement for pension fund objectives to consider movements in annuity purchase prices. |
| Sterling Other Fix Interest | Fixed Interest | Funds with investment policy permitting significant changes in asset allocation between broad investment grade and subinvestment grade securities; funds which invest at least 80% of their assets in sterling denominated (or hedged back to sterling) fixed interest securities; fixed interest defined as Government Sovereign Bonds and Corporate Bonds; Preference Shares, Permanent Interest Bearing Shares and Convertibles are not treated as fixed interest investments. |
| Sterling Preference Shares & Convertibles | Fixed Interest | Funds which invest at least 80% of their assets in sterling denominated (or hedged back to sterling) Preference Shares, Permanent Interest Bearing Shares and Convertibles. |
| UK All Companies | Equity | Funds which invest at least 80% of their assets in equities quoted on the UK stock market; funds have the primary objective of achieving capital growth or total return. |
| UK Direct Property | Real Estate | Funds that normally invest at least 80% of their assets in UK property. Managers may occasionally use Property Index Certificates or other property instruments for up to 20% property investment.UK property defined as real estate located within the UK. |
| UK Equity Income | Equity | Funds which invest at least 80% of their assets in equities quoted on the UK stock market; net of tax yield on the underlying portfolio at least 110% of the FTSE All Share yield. |
| UK Gilt | Fixed Interest | Funds which invest at least 80% of their assets in UK Government securities (Gilts). |
| UK Index-Linked Gilts | Fixed Interest | Funds which invest at least 80% of their assets in UK Index Linked Government securities (Index-Linked Gilts). |
| UK Property Securities | Real Estate | Funds that invest at least 80% of their assets in property securities quoted on the UK stock market and direct property located in the UK. Property securities include real estate investment trusts, shares issued by companies that own, develop or manage direct property and Property Index Certificates. |
| UK Smaller Companies | Equity | Funds which invest at least 80% of their assets in equities quoted on the UK stock market which form the bottom 10% by market capitalisation. |
| Unclassified | Unclassified | Funds that do not provide sufficient data for the ICC to monitor their classification effectively. |

## C. Calculation of the M2 Measure (Chapter 3)

The M2 is calculated with the following formula:

$$M2 = R_i^* - R_B \qquad (1),$$

where $R_i^*$ is the return of the new adjusted portfolio, adjusted to the risk of the benchmark portfolio.

The M2 can be derived using the following formula:

$$\frac{R_i - r_f}{\sigma_i} = \frac{R_i^* - r_f}{\sigma_B} \qquad (2),$$

where sigma denotes standard deviation of returns and $r_f$ the return of the risk-free asset. This is based on the fact that the fund portfolio and the adjusted portfolio have the same Sharpe ratio and the adjusted fund has the same risk (sigma) as the fund's benchmark. Manipulating (2) produces the following:

$$\frac{R_i - r_f}{\sigma_i} = \frac{R_i^* - r_f}{\sigma_B} \Leftrightarrow \frac{R_i^* - r_f}{R_i - r_f} = \frac{\sigma_B}{\sigma_i} \Leftrightarrow R_i^* = \frac{\sigma_B}{\sigma_i}\left(R_i - r_f\right) + r_f \Leftrightarrow R_i^* = \frac{\sigma_B (R_i - r_f) + r_f \sigma_i}{\sigma_i}$$

Combining this with (1) gives the following:

$$M2 = R_i^* - R_B = \frac{\sigma_B (R_i - r_f) + r_f \sigma_i}{\sigma_i} - R_B = \frac{\sigma_B (R_i - r_f) + r_f \sigma_i - R_B \sigma_i}{\sigma_i}$$

or

$$M2 = \frac{\sigma_B (R_i - r_f) - \sigma_i (R_B - r_f)}{\sigma_i} \qquad (3),$$

which is the way M2 has been calculated for this analysis.

## D. Summary statistics for the independent variables (Chapter 3)

This Appendix shows the summary statistics for all individual explanatory variables used in specifications (3) and (4). The statistics are sorted by fund type and sample size. The columns under 'Unrestricted' show the statistics for all observations in each sample. The columns under 'Restricted' show the statistics under the restriction that fund's age is up to 5 years.

| | | ***Unrestricted*** | | | | ***Restricted*** | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sample** | **Variable** | **Mean** | **Std. Dev.** | **Min** | **Max** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| All Funds | $age_{i,t}$ | 6.77 | 6.54 | 0.50 | 34.92 | 2.41 | 1.25 | 0.50 | 5.00 |
| | $\ln(age_{i,t}+1)$ | 1.74 | 0.78 | 0.41 | 3.58 | 1.15 | 0.39 | 0.41 | 1.79 |
| | $\sqrt[2]{age_{i,t}}$ | 2.34 | 1.15 | 0.71 | 5.91 | 1.49 | 0.42 | 0.71 | 2.24 |
| | $\sqrt[3]{age_{i,t}}$ | 1.71 | 0.56 | 0.80 | 3.27 | 1.29 | 0.25 | 0.80 | 1.71 |
| | $Bear_{i,t}$ | 0.22 | 0.41 | 0.00 | 1.00 | 0.23 | 0.42 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.44 | 0.50 | 0.00 | 1.00 | 0.44 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 3.64 | 2.77 | 0.01 | 10.85 | 3.85 | 2.70 | 0.01 | 10.85 |
| | $Share_{i,t-1}$ | 7.50 | 7.25 | 0.09 | 100.00 | 7.47 | 7.14 | 0.09 | 100.00 |
| | $ABIshare_{i,t-1}$ | 7.86 | 5.57 | 0.13 | 100.00 | 7.79 | 5.79 | 0.13 | 100.00 |
| | $p0\_5_{i,t}$ | 0.03 | 0.16 | 0.00 | 1.00 | 0.05 | 0.21 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.04 | 0.18 | 0.00 | 1.00 | 0.04 | 0.20 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.06 | 0.24 | 0.00 | 1.00 | 0.05 | 0.22 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.09 | 0.28 | 0.00 | 1.00 | 0.07 | 0.25 | 0.00 | 1.00 |
| | $PPP_t$ | 0.98 | 0.12 | 0.00 | 1.00 | 0.98 | 0.15 | 0.00 | 1.00 |
| | $STK_t$ | 0.82 | 0.39 | 0.00 | 1.00 | 0.88 | 0.32 | 0.00 | 1.00 |
| Allocation Funds | $age_{i,t}$ | 5.49 | 4.98 | 0.51 | 30.54 | 2.39 | 1.24 | 0.51 | 5.00 |
| | $\ln(age_{i,t}+1)$ | 1.62 | 0.70 | 0.41 | 3.45 | 1.15 | 0.38 | 0.41 | 1.79 |
| | $\sqrt[2]{age_{i,t}}$ | 2.13 | 0.97 | 0.71 | 5.53 | 1.49 | 0.42 | 0.71 | 2.24 |
| | $\sqrt[3]{age_{i,t}}$ | 1.62 | 0.49 | 0.80 | 3.13 | 1.29 | 0.25 | 0.80 | 1.71 |
| | $Bear_{i,t}$ | 0.24 | 0.43 | 0.00 | 1.00 | 0.25 | 0.43 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.48 | 0.50 | 0.00 | 1.00 | 0.47 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 3.74 | 2.84 | 0.01 | 10.85 | 4.08 | 2.78 | 0.01 | 10.85 |
| | $Share_{i,t-1}$ | 5.99 | 3.69 | 0.20 | 25.00 | 6.22 | 3.79 | 0.20 | 25.00 |
| | $ABIshare_{i,t-1}$ | 7.74 | 6.34 | 0.47 | 50.00 | 6.64 | 4.97 | 0.47 | 50.00 |
| | $p0\_5_{i,t}$ | 0.02 | 0.14 | 0.00 | 1.00 | 0.03 | 0.18 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.03 | 0.18 | 0.00 | 1.00 | 0.04 | 0.19 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.06 | 0.24 | 0.00 | 1.00 | 0.05 | 0.21 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.07 | 0.25 | 0.00 | 1.00 | 0.05 | 0.21 | 0.00 | 1.00 |
| | $PPP_t$ | 1.00 | 0.06 | 0.00 | 1.00 | 0.99 | 0.07 | 0.00 | 1.00 |
| | $STK_t$ | 0.88 | 0.33 | 0.00 | 1.00 | 0.89 | 0.31 | 0.00 | 1.00 |
| Fixed Income Funds | $age_{i,t}$ | 8.07 | 7.88 | 0.51 | 34.92 | 2.40 | 1.24 | 0.51 | 5.00 |
| | $\ln(age_{i,t}+1)$ | 1.85 | 0.84 | 0.41 | 3.58 | 1.15 | 0.38 | 0.41 | 1.79 |
| | $\sqrt[2]{age_{i,t}}$ | 2.53 | 1.30 | 0.71 | 5.91 | 1.49 | 0.42 | 0.71 | 2.24 |
| | $\sqrt[3]{age_{i,t}}$ | 1.80 | 0.62 | 0.80 | 3.27 | 1.29 | 0.25 | 0.80 | 1.71 |
| | $Bear_{i,t}$ | 0.15 | 0.36 | 0.00 | 1.00 | 0.18 | 0.38 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.40 | 0.49 | 0.00 | 1.00 | 0.37 | 0.48 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 3.36 | 2.63 | 0.01 | 10.85 | 3.78 | 2.59 | 0.01 | 10.85 |
| | $Share_{i,t-1}$ | 9.72 | 10.02 | 0.33 | 100.00 | 9.65 | 10.13 | 0.33 | 100.00 |
| | $ABIshare_{i,t-1}$ | 4.09 | 3.09 | 0.22 | 20.00 | 3.33 | 2.70 | 0.22 | 20.00 |
| | $p0\_5_{i,t}$ | 0.03 | 0.16 | 0.00 | 1.00 | 0.05 | 0.21 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.04 | 0.20 | 0.00 | 1.00 | 0.04 | 0.19 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.07 | 0.25 | 0.00 | 1.00 | 0.05 | 0.21 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.10 | 0.30 | 0.00 | 1.00 | 0.07 | 0.26 | 0.00 | 1.00 |
| | $PPP_t$ | 0.97 | 0.17 | 0.00 | 1.00 | 0.96 | 0.20 | 0.00 | 1.00 |
| | $STK_t$ | 0.77 | 0.42 | 0.00 | 1.00 | 0.87 | 0.34 | 0.00 | 1.00 |

| Sample | Variable | Unrestricted Mean | Std. Dev. | Min | Max | Restricted Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|---|---|---|---|
| Equity Funds | $age_{i,t}$ | 6.49 | 6.17 | 0.50 | 34.92 | 2.43 | 1.25 | 0.50 | 5.00 |
| | $\ln(age_{i,t}+1)$ | 1.72 | 0.76 | 0.41 | 3.58 | 1.16 | 0.39 | 0.41 | 1.79 |
| | $\sqrt[2]{age_{i,t}}$ | 2.30 | 1.10 | 0.71 | 5.91 | 1.50 | 0.42 | 0.71 | 2.24 |
| | $\sqrt[3]{age_{i,t}}$ | 1.70 | 0.55 | 0.80 | 3.27 | 1.30 | 0.25 | 0.80 | 1.71 |
| | $Bear_{i,t}$ | 0.24 | 0.42 | 0.00 | 1.00 | 0.24 | 0.43 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.45 | 0.50 | 0.00 | 1.00 | 0.45 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 3.65 | 2.79 | 0.01 | 10.85 | 3.80 | 2.70 | 0.01 | 10.85 |
| | $Share_{i,t-1}$ | 6.91 | 6.20 | 0.09 | 100.00 | 6.98 | 6.26 | 0.09 | 100.00 |
| | $ABIshare_{i,t-1}$ | 8.85 | 5.39 | 0.13 | 33.33 | 8.91 | 5.54 | 0.13 | 33.33 |
| | $p0\_5_{i,t}$ | 0.03 | 0.16 | 0.00 | 1.00 | 0.05 | 0.22 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.04 | 0.19 | 0.00 | 1.00 | 0.04 | 0.20 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.06 | 0.24 | 0.00 | 1.00 | 0.05 | 0.22 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.09 | 0.28 | 0.00 | 1.00 | 0.07 | 0.25 | 0.00 | 1.00 |
| | $PPP_t$ | 0.99 | 0.11 | 0.00 | 1.00 | 0.98 | 0.14 | 0.00 | 1.00 |
| | $STK_t$ | 0.82 | 0.38 | 0.00 | 1.00 | 0.88 | 0.33 | 0.00 | 1.00 |
| Emerging Equity Funds | $age_{i,t}$ | 4.40 | 4.35 | 0.50 | 25.96 | 2.17 | 1.19 | 0.50 | 4.98 |
| | $\ln(age_{i,t}+1)$ | 1.44 | 0.67 | 0.41 | 3.29 | 1.08 | 0.39 | 0.41 | 1.79 |
| | $\sqrt[2]{age_{i,t}}$ | 1.90 | 0.90 | 0.71 | 5.09 | 1.41 | 0.42 | 0.71 | 2.23 |
| | $\sqrt[3]{age_{i,t}}$ | 1.50 | 0.47 | 0.80 | 2.96 | 1.25 | 0.25 | 0.80 | 1.71 |
| | $Bear_{i,t}$ | 0.25 | 0.44 | 0.00 | 1.00 | 0.26 | 0.44 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.47 | 0.50 | 0.00 | 1.00 | 0.48 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 4.72 | 3.02 | 0.01 | 10.85 | 4.92 | 2.91 | 0.01 | 10.85 |
| | $Share_{i,t-1}$ | 15.76 | 16.83 | 0.36 | 100.00 | 14.87 | 15.91 | 0.36 | 100.00 |
| | $ABIshare_{i,t-1}$ | 3.58 | 2.05 | 0.32 | 19.05 | 3.49 | 2.20 | 0.32 | 19.05 |
| | $p0\_5_{i,t}$ | 0.01 | 0.09 | 0.00 | 1.00 | 0.01 | 0.11 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.03 | 0.16 | 0.00 | 1.00 | 0.04 | 0.19 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.06 | 0.24 | 0.00 | 1.00 | 0.05 | 0.22 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.05 | 0.22 | 0.00 | 1.00 | 0.02 | 0.13 | 0.00 | 1.00 |
| | $PPP_t$ | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| | $STK_t$ | 0.93 | 0.26 | 0.00 | 1.00 | 0.94 | 0.23 | 0.00 | 1.00 |
| International Equity Funds | $age_{i,t}$ | 6.84 | 6.20 | 0.51 | 30.54 | 2.42 | 1.26 | 0.51 | 5.00 |
| | $\ln(age_{i,t}+1)$ | 1.77 | 0.77 | 0.41 | 3.45 | 1.16 | 0.39 | 0.41 | 1.79 |
| | $\sqrt[2]{age_{i,t}}$ | 2.36 | 1.12 | 0.71 | 5.53 | 1.50 | 0.42 | 0.71 | 2.24 |
| | $\sqrt[3]{age_{i,t}}$ | 1.73 | 0.55 | 0.80 | 3.13 | 1.30 | 0.25 | 0.80 | 1.71 |
| | $Bear_{i,t}$ | 0.23 | 0.42 | 0.00 | 1.00 | 0.24 | 0.43 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.45 | 0.50 | 0.00 | 1.00 | 0.46 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 3.57 | 2.76 | 0.01 | 10.85 | 3.74 | 2.67 | 0.01 | 10.85 |
| | $Share_{i,t-1}$ | 6.43 | 4.35 | 0.09 | 40.00 | 6.39 | 4.21 | 0.09 | 40.00 |
| | $ABIshare_{i,t-1}$ | 6.97 | 3.64 | 0.13 | 21.82 | 7.08 | 3.73 | 0.13 | 21.82 |
| | $p0\_5_{i,t}$ | 0.02 | 0.15 | 0.00 | 1.00 | 0.04 | 0.20 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.04 | 0.19 | 0.00 | 1.00 | 0.05 | 0.21 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.07 | 0.25 | 0.00 | 1.00 | 0.06 | 0.23 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.09 | 0.29 | 0.00 | 1.00 | 0.06 | 0.24 | 0.00 | 1.00 |
| | $PPP_t$ | 0.99 | 0.11 | 0.00 | 1.00 | 0.98 | 0.14 | 0.00 | 1.00 |
| | $STK_t$ | 0.80 | 0.40 | 0.00 | 1.00 | 0.87 | 0.34 | 0.00 | 1.00 |

| Sample | Variable | Unrestricted | | | | Restricted | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Dev. | Min | Max | Mean | Std. Dev. | Min | Max |
| UK Equity Funds | $age_{i,t}$ | 6.20 | 6.21 | 0.51 | 34.92 | 2.46 | 1.25 | 0.51 | 5.00 |
| | $\ln(age_{i,t}+1)$ | 1.68 | 0.74 | 0.41 | 3.58 | 1.17 | 0.38 | 0.41 | 1.79 |
| | $\sqrt[2]{age_{i,t}}$ | 2.24 | 1.09 | 0.71 | 5.91 | 1.51 | 0.42 | 0.71 | 2.24 |
| | $\sqrt[3]{age_{i,t}}$ | 1.67 | 0.54 | 0.80 | 3.27 | 1.30 | 0.25 | 0.80 | 1.71 |
| | $Bear_{i,t}$ | 0.24 | 0.43 | 0.00 | 1.00 | 0.25 | 0.43 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.44 | 0.50 | 0.00 | 1.00 | 0.44 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 3.66 | 2.80 | 0.01 | 10.85 | 3.76 | 2.69 | 0.01 | 10.85 |
| | $Share_{i,t-1}$ | 6.84 | 6.15 | 0.21 | 80.00 | 6.93 | 6.15 | 0.21 | 80.00 |
| | $ABIshare_{i,t-1}$ | 11.77 | 6.05 | 0.38 | 33.33 | 11.65 | 6.25 | 0.38 | 33.33 |
| | $p0\_5_{i,t}$ | 0.03 | 0.18 | 0.00 | 1.00 | 0.06 | 0.24 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.04 | 0.19 | 0.00 | 1.00 | 0.04 | 0.19 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.06 | 0.23 | 0.00 | 1.00 | 0.04 | 0.20 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.09 | 0.28 | 0.00 | 1.00 | 0.07 | 0.26 | 0.00 | 1.00 |
| | $PPP_t$ | 0.98 | 0.13 | 0.00 | 1.00 | 0.98 | 0.15 | 0.00 | 1.00 |
| | $STK_t$ | 0.84 | 0.37 | 0.00 | 1.00 | 0.89 | 0.31 | 0.00 | 1.00 |

# E. Tables 3.3.A – 3.3.G (Chapter 3)

Table 3.3.A. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. All-funds sample.

**All Funds**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9284 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9753 | 0.9874 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9533 | 0.9971 | 0.9963 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0451 | -0.0609 | -0.0553 | -0.0596 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0323 | 0.0309 | 0.0324 | 0.0322 | **-0.4699** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | -0.0683 | -0.0629 | -0.0678 | -0.0643 | 0.0329 | -0.1497 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0018 | 0.0247 | 0.0139 | 0.0203 | -0.0555 | 0.0345 | 0.2995 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.0051 | 0.0191 | 0.0085 | 0.0146 | 0.0297 | 0.0512 | -0.1392 | -0.0148 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1170 | -0.1456 | -0.1360 | -0.1411 | -0.0023 | -0.0260 | -0.1889 | -0.1187 | 0.1212 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.0868 | -0.0833 | -0.0863 | -0.0851 | 0.0069 | -0.0544 | -0.2081 | -0.0591 | 0.0616 | -0.0312 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0264 | 0.0190 | 0.0003 | 0.0096 | -0.0105 | 0.0247 | -0.2223 | -0.0191 | 0.0081 | -0.0420 | -0.0493 | 1 | | | |
| $p15\_20_{i,t}$ | 0.0379 | 0.0763 | 0.0624 | 0.0694 | 0.0029 | -0.0184 | -0.2703 | 0.0227 | 0.0398 | -0.0508 | -0.0596 | -0.0801 | 1 | | |
| $PPP_t$ | 0.0652 | 0.0662 | 0.0672 | 0.0667 | 0.0149 | 0.0579 | 0.1403 | -0.0467 | -0.0478 | -0.1819 | -0.2304 | -0.0834 | -0.0243 | 1 | |
| $STK_t$ | -0.0655 | -0.1304 | -0.1071 | -0.1183 | 0.1001 | -0.0151 | **0.4459** | -0.1075 | -0.0664 | -0.0668 | -0.2083 | -0.2356 | -0.3421 | 0.2638 | 1 |

Table 3.3.B. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Allocation funds sample.

**Allocation Funds**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9317 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9743 | 0.9895 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9526 | 0.9979 | 0.9965 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0181 | -0.0306 | -0.0265 | -0.0298 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0189 | 0.0047 | 0.0113 | 0.0076 | **-0.5472** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | -0.1483 | -0.1346 | -0.1431 | -0.1375 | 0.0120 | -0.1791 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0782 | -0.0485 | -0.0618 | -0.0531 | -0.0808 | 0.0498 | **0.4555** | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | 0.2748 | 0.2807 | 0.2827 | 0.2828 | -0.0039 | -0.0233 | -0.3867 | 0.0085 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.0935 | -0.1051 | -0.1024 | -0.1036 | -0.0268 | -0.0181 | -0.1688 | -0.1847 | 0.1726 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.0609 | -0.0496 | -0.0550 | -0.0523 | 0.0295 | -0.0593 | -0.2169 | -0.1790 | 0.2109 | -0.0269 | 1 | | | | |
| $p10\_15_{i,t}$ | 0.0266 | 0.0588 | 0.0475 | 0.0535 | 0.0477 | 0.0298 | -0.2490 | -0.2649 | 0.1002 | -0.0360 | -0.0483 | 1 | | | |
| $p15\_20_{i,t}$ | 0.1129 | 0.1184 | 0.1189 | 0.1182 | -0.0040 | -0.0456 | -0.2660 | -0.1299 | 0.1289 | -0.0387 | -0.0520 | -0.0696 | 1 | | |
| $PPP_t$ | 0.0504 | 0.0747 | 0.0660 | 0.0716 | 0.0056 | 0.0094 | 0.0684 | -0.1312 | -0.0344 | -0.0733 | -0.1122 | 0.0143 | -0.0731 | 1 | |
| $STK_t$ | -0.0235 | -0.0486 | -0.0399 | -0.0443 | 0.1083 | 0.0531 | 0.3962 | -0.0048 | -0.2470 | -0.1834 | -0.3287 | -0.0259 | -0.2310 | 0.1506 | 1 |

Table 3.3.C. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Fixed income funds sample.

**Fixed Income Funds**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9324 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9779 | 0.9872 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9577 | 0.9969 | 0.9966 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0675 | -0.0698 | -0.0714 | -0.0709 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0768 | 0.0866 | 0.0851 | 0.0863 | -0.3515 | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | -0.1295 | -0.1343 | -0.1362 | -0.1344 | 0.1810 | -0.1942 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0193 | 0.0209 | 0.0034 | 0.0130 | -0.0431 | 0.0173 | 0.1628 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | 0.2047 | 0.2606 | 0.2409 | 0.2515 | -0.0751 | 0.0831 | **-0.4513** | 0.0678 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1178 | -0.1438 | -0.1349 | -0.1396 | 0.0254 | -0.0410 | -0.1875 | -0.1265 | 0.2092 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.0845 | -0.0596 | -0.0720 | -0.0662 | -0.0074 | -0.0247 | -0.2229 | -0.0026 | 0.2973 | -0.0335 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0359 | 0.0178 | -0.0051 | 0.0059 | -0.0496 | 0.0296 | -0.2338 | -0.0104 | 0.1998 | -0.0434 | -0.0544 | 1 | | | |
| $p15\_20_{i,t}$ | 0.0252 | 0.0730 | 0.0546 | 0.0635 | -0.0073 | 0.0506 | -0.2708 | 0.0839 | 0.1862 | -0.0544 | -0.0683 | -0.0883 | 1 | | |
| $PPP_t$ | 0.0868 | 0.0710 | 0.0797 | 0.0752 | 0.0011 | 0.1058 | 0.1875 | -0.0775 | -0.2557 | -0.2168 | -0.3214 | -0.1420 | -0.0185 | 1 | |
| $STK_t$ | -0.0479 | -0.1507 | -0.1100 | -0.1297 | 0.0899 | -0.1231 | **0.4719** | -0.2080 | **-0.4926** | -0.1396 | -0.2607 | -0.2303 | -0.3244 | 0.3310 | 1 |

Table 3.3.D. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Equity funds sample.

**Equity Funds**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9288 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9751 | 0.9877 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9531 | 0.9973 | 0.9963 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0286 | -0.0517 | -0.0428 | -0.0491 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0132 | 0.0091 | 0.0110 | 0.0108 | **-0.4984** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | -0.0580 | -0.0455 | -0.0530 | -0.0481 | 0.0131 | -0.1474 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0179 | 0.0080 | -0.0028 | 0.0038 | -0.0442 | 0.0489 | **0.4059** | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.0054 | -0.0007 | -0.0038 | -0.0015 | 0.0152 | 0.0482 | -0.0940 | -0.0430 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1209 | -0.1510 | -0.1409 | -0.1464 | -0.0074 | -0.0220 | -0.1915 | -0.1467 | 0.1062 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.0912 | -0.0930 | -0.0939 | -0.0938 | 0.0078 | -0.0611 | -0.2062 | -0.0963 | 0.0175 | -0.0321 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0232 | 0.0203 | 0.0025 | 0.0114 | -0.0078 | 0.0298 | -0.2184 | -0.0358 | -0.0332 | -0.0429 | -0.0494 | 1 | | | |
| $p15\_20_{i,t}$ | 0.0399 | 0.0747 | 0.0624 | 0.0687 | 0.0062 | -0.0340 | -0.2729 | -0.0057 | 0.0211 | -0.0519 | -0.0598 | -0.0798 | 1 | | |
| $PPP_t$ | 0.0673 | 0.0752 | 0.0733 | 0.0743 | 0.0147 | 0.0424 | 0.1311 | -0.0015 | -0.0387 | -0.1831 | -0.2119 | -0.0529 | -0.0284 | 1 | |
| $STK_t$ | -0.0689 | -0.1243 | -0.1052 | -0.1143 | 0.0989 | 0.0054 | **0.4443** | -0.0539 | -0.0036 | -0.0452 | -0.1940 | -0.2442 | -0.3446 | 0.2453 | 1 |

Table 3.3.E. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Emerging equity funds sample. Note: no observations for $PPP_t$=0 , i.e. there are no obs. before 1988.

**Emerging Equity Funds**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9262 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9705 | 0.9897 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9452 | 0.9982 | 0.9959 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0581 | -0.1039 | -0.0894 | -0.1040 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0162 | 0.0242 | 0.0220 | 0.0262 | **-0.5494** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | -0.0443 | -0.0523 | -0.0518 | -0.0495 | -0.0001 | -0.1033 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | 0.1915 | 0.1967 | 0.1979 | 0.1996 | -0.0935 | 0.1004 | 0.1887 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | 0.1263 | 0.1516 | 0.1445 | 0.1523 | 0.0003 | -0.0835 | 0.1584 | **0.5414** | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.0625 | -0.0820 | -0.0758 | -0.0795 | 0.0169 | -0.0253 | -0.1288 | -0.0839 | -0.0685 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1017 | -0.1198 | -0.1145 | -0.1160 | 0.0501 | -0.0979 | -0.2015 | -0.0256 | 0.1931 | -0.0148 | 1 | | | | |
| $p10\_15_{i,t}$ | 0.0014 | 0.0621 | 0.0395 | 0.0523 | -0.0288 | 0.0151 | -0.2534 | 0.1389 | 0.1189 | -0.0236 | -0.0412 | 1 | | | |
| $p15\_20_{i,t}$ | 0.2079 | 0.2402 | 0.2340 | 0.2362 | -0.0234 | -0.0110 | -0.2395 | 0.1380 | 0.0951 | -0.0218 | -0.0381 | -0.0608 | 1 | | |
| $PPP_t$ | | | | | | | | | | | | | | | |
| $STK_t$ | -0.1037 | -0.1184 | -0.1157 | -0.1173 | 0.0116 | 0.2070 | 0.3237 | **-0.4736** | -0.3136 | 0.0255 | -0.0942 | -0.2229 | -0.3219 | | 1 |

Table 3.3.F. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. International equity funds sample.

**International Equity Funds**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9366 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9781 | 0.9889 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9582 | 0.9976 | 0.9967 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0272 | -0.0534 | -0.0430 | -0.0500 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0050 | 0.0063 | 0.0057 | 0.0069 | **-0.4918** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | -0.0490 | -0.0507 | -0.0523 | -0.0506 | 0.0072 | -0.1631 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | 0.0021 | 0.0310 | 0.0194 | 0.0264 | -0.0484 | 0.0183 | **0.4867** | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.0491 | -0.0289 | -0.0381 | -0.0328 | 0.0139 | 0.0880 | -0.1170 | 0.1448 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1192 | -0.1463 | -0.1371 | -0.1421 | -0.0043 | -0.0180 | -0.1726 | -0.1730 | 0.0317 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1037 | -0.1046 | -0.1059 | -0.1055 | 0.0180 | -0.0511 | -0.2035 | -0.1444 | 0.0136 | -0.0293 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0386 | 0.0087 | -0.0110 | -0.0010 | -0.0095 | 0.0417 | -0.2241 | -0.0814 | -0.0061 | -0.0406 | -0.0516 | 1 | | | |
| $p15\_20_{i,t}$ | 0.0351 | 0.0735 | 0.0594 | 0.0666 | -0.0135 | -0.0307 | -0.2678 | -0.0124 | -0.0140 | -0.0477 | -0.0606 | -0.0839 | 1 | | |
| $PPP_t$ | 0.0786 | 0.0934 | 0.0886 | 0.0912 | -0.0367 | 0.0487 | 0.1201 | 0.0017 | -0.0406 | -0.1430 | -0.1722 | -0.0695 | -0.0464 | 1 | |
| $STK_t$ | -0.0460 | -0.1177 | -0.0912 | -0.1042 | 0.0700 | 0.0044 | **0.4638** | -0.0418 | -0.0888 | -0.0419 | -0.1715 | -0.2420 | -0.3704 | 0.2142 | 1 |

Table 3.3.G. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. UK equity funds sample.

**UK Equity Funds**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9187 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9716 | 0.9859 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9468 | 0.9968 | 0.9959 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0260 | -0.0425 | -0.0364 | -0.0409 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0244 | 0.0124 | 0.0180 | 0.0155 | **-0.5031** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | -0.0589 | -0.0241 | -0.0409 | -0.0311 | 0.0200 | -0.1332 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0300 | 0.0005 | -0.0125 | -0.0047 | -0.0468 | 0.0739 | **0.4405** | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | 0.0463 | 0.0404 | 0.0428 | 0.0422 | 0.0106 | 0.0449 | -0.1012 | -0.1411 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1260 | -0.1624 | -0.1502 | -0.1569 | -0.0125 | -0.0257 | -0.2175 | -0.1654 | 0.1499 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.0765 | -0.0780 | -0.0789 | -0.0791 | -0.0082 | -0.0717 | -0.2102 | -0.0859 | 0.0168 | -0.0368 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0056 | 0.0314 | 0.0170 | 0.0238 | -0.0028 | 0.0136 | -0.2086 | -0.0388 | -0.0515 | -0.0460 | -0.0470 | 1 | | | |
| $p15\_20_{i,t}$ | 0.0354 | 0.0634 | 0.0539 | 0.0588 | 0.0344 | -0.0397 | -0.2809 | -0.0115 | 0.0460 | -0.0593 | -0.0606 | -0.0757 | 1 | | |
| $PPP_t$ | 0.0577 | 0.0585 | 0.0596 | 0.0591 | 0.0721 | 0.0365 | 0.1481 | -0.0158 | -0.0250 | -0.2195 | -0.2629 | -0.0368 | -0.0082 | 1 | |
| $STK_t$ | -0.0869 | -0.1200 | -0.1109 | -0.1148 | 0.1439 | -0.0052 | **0.4231** | -0.0593 | 0.0468 | -0.0543 | -0.2322 | -0.2489 | -0.3084 | 0.2937 | 1 |

# F. Regression results for specifications with other age functions (Chapter 3)

Table F1.A. Results for the all-funds sample with $f(age_{i,t}) = age_{i,t}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0246** | **0.1161** | **0.0764** | **0.0260** | **0.0409** | **-0.0192** | **-0.0761** | **0.1749** | **0.1265** |
| | (0.864) | (0.262) | (0.438) | (0.776) | (0.898) | (0.954) | (0.569) | (0.483) | (0.637) |
| $f(age_{i,t})$ | **-0.0083** | **-0.0003** | **0.0016** | **-0.0133*** | **-0.0086** | **-0.0048** | **-0.0052** | **0.0028** | **0.0048** |
| | (0.496) | (0.977) | (0.879) | (0.081) | (0.357) | (0.645) | (0.401) | (0.759) | (0.663) |
| $\boldsymbol{Bear_{i,t}}$ | | **-0.5305***** | **-0.5547***** | | **0.0459** | **0.0209** | | **-0.0463** | **-0.0763** |
| | | (0.000) | (0.000) | | (0.260) | (0.652) | | (0.418) | (0.276) |
| $\boldsymbol{Bull_{i,t}}$ | | **0.0659** | **0.0943** | | **0.0528** | **0.0906** | | **-0.1488**** | **-0.1373*** |
| | | (0.368) | (0.164) | | (0.369) | (0.288) | | (0.016) | (0.088) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0225** | **0.0220** | **0.0400*** | **0.0319*** | **0.0348** | **0.0678*** | **0.0576**** | **0.0419*** | **0.0686*** |
| | (0.504) | (0.138) | (0.053) | (0.096) | (0.102) | (0.062) | (0.033) | (0.088) | (0.067) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0054*** | **0.0004** | **-0.0004** | **0.0056*** | **0.0053*** | **0.0038** | **-0.0008** | **0.0005** | **-0.0006** |
| | (0.064) | (0.844) | (0.851) | (0.061) | (0.072) | (0.193) | (0.825) | (0.875) | (0.852) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0011** | **0.0010** | **0.0003** | **0.0138***** | **0.0135***** | **0.0119***** | **0.0158**** | **0.0156**** | **0.0143*** |
| | (0.792) | (0.726) | (0.908) | (0.003) | (0.003) | (0.006) | (0.038) | (0.045) | (0.052) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.0649** | **-0.0236** | **-0.1196** | **-0.1246** | **-0.1096** | **-0.2477** | **0.0703** | **0.0357** | **-0.0169** |
| | (0.743) | (0.816) | (0.352) | (0.545) | (0.541) | (0.394) | (0.728) | (0.853) | (0.951) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.1204** | **0.0094** | **-0.0000** | **-0.3406*** | **-0.3252**** | **-0.4656***** | **-0.0768** | **-0.1436** | **-0.2021** |
| | (0.481) | (0.910) | (1.000) | (0.053) | (0.016) | (0.008) | (0.557) | (0.267) | (0.212) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.0468** | **0.0243** | **-0.0267** | **-0.1266** | **-0.1193** | **-0.2506*** | **0.0219** | **-0.0056** | **-0.1017** |
| | (0.756) | (0.727) | (0.769) | (0.182) | (0.185) | (0.064) | (0.801) | (0.952) | (0.437) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.0279** | **0.0383** | **0.0163** | **-0.0424** | **-0.0412** | **-0.0486** | **0.0704** | **0.0265** | **0.0227** |
| | (0.756) | (0.430) | (0.765) | (0.492) | (0.525) | (0.566) | (0.296) | (0.627) | (0.716) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | | | **0.0478*** | | | **0.0826** | | | **0.0441** |
| | | | (0.086) | | | (0.206) | | | (0.302) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | | | **0.0061** | | | **0.0404**** | | | **0.0201** |
| | | | (0.529) | | | (0.045) | | | (0.323) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | | | **0.0073** | | | **0.0185**** | | | **0.0140** |
| | | | (0.160) | | | (0.046) | | | (0.190) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | | | **0.0023** | | | **0.0000** | | | **-0.0002** |
| | | | (0.441) | | | (0.998) | | | (0.961) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | | | **-0.0014***** | | | **-0.0027**** | | | **-0.0022**** |
| | | | (0.009) | | | (0.038) | | | (0.036) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | | | **0.0046** | | | **0.0053** | | | **0.0055** |
| | | | (0.192) | | | (0.129) | | | (0.210) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | | | **-0.0030** | | | **-0.0038** | | | **-0.0006** |
| | | | (0.330) | | | (0.410) | | | (0.903) |
| $\boldsymbol{PPP_t}$ | | **-0.0529** | **-0.0627** | | **-0.0205** | **-0.0525** | | **-0.0990** | **-0.1150** |
| | | (0.547) | (0.473) | | (0.941) | (0.850) | | (0.614) | (0.558) |
| $\boldsymbol{STK_t}$ | | **-0.0352** | **-0.0220** | | **-0.0820** | **-0.0526** | | **-0.0920** | **-0.0702** |
| | | (0.696) | (0.805) | | (0.469) | (0.661) | | (0.421) | (0.544) |
| $R^2$ within | 0.0078 | 0.3964 | 0.4007 | 0.0055 | 0.0066 | 0.0094 | 0.0144 | 0.0230 | 0.0249 |
| F-statistic | 2.0413 | 35.8669 | 123.7760 | 2.3948 | 2.3166 | 52.7421 | 1.1505 | 3.3636 | 132.2577 |
| p-value | 0.0778 | 0.0000 | 0.0000 | 0.0417 | 0.0329 | 0.0000 | 0.3623 | 0.0040 | 0.0000 |
| Funds | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 |
| Observations | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 |

Table F1.B. Results for the allocation funds sample with $f(age_{i,t}) = age_{i,t}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.1039** | **-0.0308** | **-0.1010** | **0.1421** | **-0.8660**** | **-1.2511***** | **-0.1216** | **-0.5167**** | **-0.6050**** |
| | (0.605) | (0.845) | (0.507) | (0.516) | (0.012) | (0.001) | (0.575) | (0.029) | (0.025) |
| $f(age_{i,t})$ | **-0.0141** | **-0.0155** | **-0.0111** | **-0.0276** | **-0.0481**** | **-0.0184** | **0.0056** | **-0.0003** | **0.0150** |
| | (0.587) | (0.138) | (0.389) | (0.130) | (0.031) | (0.467) | (0.709) | (0.990) | (0.668) |
| $Bear_{i,t}$ | | **-0.6509***** | **-0.6334***** | | **0.3525***** | **0.4921***** | | **-0.0537** | **-0.0155** |
| | | (0.000) | (0.000) | | (0.002) | (0.000) | | (0.659) | (0.924) |
| $Bull_{i,t}$ | | **-0.0323** | **-0.0222** | | **0.3080** | **0.3868** | | **-0.1023** | **-0.1452** |
| | | (0.779) | (0.862) | | (0.120) | (0.124) | | (0.500) | (0.468) |
| $Size_{i,t-1}$ | **0.0553** | **0.0462** | **0.0764** | **0.0824*** | **0.1422**** | **0.2192**** | **0.0931**** | **0.0794*** | **0.0947** |
| | (0.411) | (0.164) | (0.135) | (0.056) | (0.050) | (0.033) | (0.041) | (0.095) | (0.120) |
| $Share_{i,t-1}$ | **-0.0030** | **-0.0168** | **-0.0176** | **-0.0446**** | **-0.0586*** | **-0.0552** | **-0.0306** | **-0.0219** | **-0.0161** |
| | (0.891) | (0.182) | (0.158) | (0.014) | (0.072) | (0.100) | (0.130) | (0.314) | (0.471) |
| $ABIshare_{i,t-1}$ | **0.0102** | **0.0194** | **0.0169** | **0.0288** | **0.0396** | **0.0335** | **0.0238** | **0.0157** | **0.0112** |
| | (0.641) | (0.181) | (0.215) | (0.413) | (0.368) | (0.442) | (0.454) | (0.634) | (0.738) |
| $p0\_5_{i,t}$ | **-0.0547** | **0.0363** | **0.2329** | **-0.4635*** | **-0.4547*** | **-0.0625** | **0.3088** | **0.3584** | **0.5552** |
| | (0.867) | (0.692) | (0.509) | (0.092) | (0.096) | (0.893) | (0.208) | (0.169) | (0.117) |
| $p5\_10_{i,t}$ | **-0.1429** | **0.0531** | **-0.0308** | **-0.7141**** | **-0.6266*** | **-0.6091**** | **-0.0131** | **0.0735** | **0.0290** |
| | (0.592) | (0.683) | (0.802) | (0.036) | (0.054) | (0.042) | (0.941) | (0.715) | (0.923) |
| $p10\_15_{i,t}$ | **-0.0401** | **0.0481** | **-0.0645** | **-0.1223** | **-0.1203** | **0.1863** | **0.2978*** | **0.3034*** | **0.6502*** |
| | (0.801) | (0.533) | (0.602) | (0.617) | (0.597) | (0.604) | (0.054) | (0.053) | (0.062) |
| $p15\_20_{i,t}$ | **0.0182** | **0.0468** | **0.0728** | **-0.1163** | **0.0239** | **0.3090*** | **0.2239** | **0.2225*** | **0.5496***** |
| | (0.899) | (0.501) | (0.461) | (0.310) | (0.860) | (0.092) | (0.109) | (0.072) | (0.009) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **-0.0535** | | | **-0.2497**** | | | **-0.2041***** |
| | | | (0.555) | | | (0.047) | | | (0.010) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0221** | | | **-0.0612** | | | **-0.0595** |
| | | | (0.255) | | | (0.255) | | | (0.335) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0119** | | | **-0.0815**** | | | **-0.0850*** |
| | | | (0.469) | | | (0.038) | | | (0.091) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.0067** | | | **-0.0557***** | | | **-0.0586**** |
| | | | (0.539) | | | (0.009) | | | (0.032) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0028*** | | | **-0.0080***** | | | **-0.0030** |
| | | | (0.093) | | | (0.002) | | | (0.326) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **-0.0027** | | | **-0.0241***** | | | **-0.0079** |
| | | | (0.393) | | | (0.007) | | | (0.545) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0015** | | | **-0.0120** | | | **0.0065** |
| | | | (0.782) | | | (0.282) | | | (0.618) |
| $PPP_t$ | | **0.0005** | **-0.0122** | | **0.5847*** | **0.6591**** | | **0.4146** | **0.4556*** |
| | | (0.997) | (0.930) | | (0.097) | (0.037) | | (0.122) | (0.094) |
| $STK_t$ | | **0.1600** | **0.1865*** | | **0.0769** | **0.1422** | | **0.1521** | **0.1503** |
| | | (0.182) | (0.096) | | (0.751) | (0.545) | | (0.570) | (0.540) |
| $R^2$ within | 0.0259 | 0.5064 | 0.5112 | 0.0209 | 0.0549 | 0.0680 | 0.0428 | 0.0463 | 0.0556 |
| F-statistic | 0.9016 | 49.3314 | 196.4879 | 2.6853 | 25.7008 | 189.7455 | 2.4924 | 6.6545 | 141.9122 |
| p-value | 0.5316 | 0.0000 | 0.0000 | 0.0303 | 0.0000 | 0.0000 | 0.0413 | 0.0001 | 0.0000 |
| Funds | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 |
| Observations | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 |

Table F1.C. Results for the fixed income funds sample with $f(age_{i,t}) = age_{i,t}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0058** | **0.0016** | **-0.0700** | **0.1845** | **0.1095** | **-0.0450** | **0.2865*** | **0.1491** | **0.0620** |
| | (0.967) | (0.993) | (0.704) | (0.361) | (0.789) | (0.921) | (0.066) | (0.511) | (0.803) |
| $f(\boldsymbol{age}_{i,t})$ | **-0.0155**** | **-0.0025** | **-0.0002** | **-0.0330***** | **-0.0399***** | **-0.0300**** | **-0.0298***** | **-0.0389***** | **-0.0300***** |
| | (0.047) | (0.884) | (0.990) | (0.002) | (0.004) | (0.012) | (0.000) | (0.001) | (0.005) |
| $\boldsymbol{Bear}_{i,t}$ | | **-0.2545**** | **-0.3430***** | | **0.1071** | **0.0147** | | **0.1988***** | **0.1729*** |
| | | (0.031) | (0.008) | | (0.394) | (0.927) | | (0.006) | (0.073) |
| $\boldsymbol{Bull}_{i,t}$ | | **0.1291** | **0.1563** | | **-0.0339** | **0.0762** | | **-0.0808*** | **0.0084** |
| | | (0.264) | (0.182) | | (0.572) | (0.447) | | (0.076) | (0.903) |
| $\boldsymbol{Size}_{i,t-1}$ | **0.0426** | **0.0597**** | **0.1045**** | **0.0859*** | **0.0812*** | **0.1613*** | **0.0682*** | **0.0576** | **0.1146*** |
| | (0.143) | (0.019) | (0.026) | (0.094) | (0.086) | (0.091) | (0.083) | (0.118) | (0.092) |
| $\boldsymbol{Share}_{i,t-1}$ | **0.0035** | **0.0029** | **0.0011** | **0.0005** | **0.0008** | **-0.0022** | **-0.0018** | **-0.0013** | **-0.0034** |
| | (0.133) | (0.248) | (0.699) | (0.932) | (0.890) | (0.682) | (0.696) | (0.777) | (0.429) |
| $\boldsymbol{ABIshare}_{i,t-1}$ | **-0.0041** | **-0.0073** | **-0.0134** | **0.0157** | **0.0181** | **0.0073** | **0.0045** | **0.0069** | **-0.0027** |
| | (0.811) | (0.531) | (0.191) | (0.520) | (0.445) | (0.729) | (0.777) | (0.672) | (0.834) |
| $\boldsymbol{p0\_5}_{i,t}$ | **-0.3519**** | **-0.1579** | **-0.2952** | **-0.2131** | **-0.2698** | **-0.2636** | **-0.2377** | **-0.3013** | **-0.5158** |
| | (0.039) | (0.220) | (0.156) | (0.381) | (0.360) | (0.587) | (0.197) | (0.189) | (0.229) |
| $\boldsymbol{p5\_10}_{i,t}$ | **-0.2308*** | **-0.0612** | **0.0233** | **-0.3493** | **-0.3977** | **-0.2883** | **-0.2986**** | **-0.3593**** | **-0.3660**** |
| | (0.060) | (0.545) | (0.852) | (0.307) | (0.147) | (0.285) | (0.031) | (0.033) | (0.049) |
| $\boldsymbol{p10\_15}_{i,t}$ | **-0.1621**** | **-0.0598** | **-0.0783** | **-0.1044** | **-0.1366** | **-0.1442** | **-0.0857** | **-0.1362** | **-0.1531** |
| | (0.028) | (0.408) | (0.462) | (0.477) | (0.440) | (0.615) | (0.442) | (0.332) | (0.443) |
| $\boldsymbol{p15\_20}_{i,t}$ | **-0.0761** | **0.0053** | **-0.0018** | **-0.0132** | **-0.0417** | **0.0546** | **0.0070** | **-0.0515** | **0.0470** |
| | (0.245) | (0.941) | (0.986) | (0.783) | (0.388) | (0.400) | (0.876) | (0.293) | (0.500) |
| $f(\boldsymbol{age}_{i,t}) \cdot \boldsymbol{p0\_5}_{i,t}$ | | | **0.0693** | | | **0.0283** | | | **0.0974** |
| | | | (0.150) | | | (0.796) | | | (0.326) |
| $f(\boldsymbol{age}_{i,t}) \cdot \boldsymbol{p5\_10}_{i,t}$ | | | **-0.0103** | | | **-0.0131** | | | **0.0065** |
| | | | (0.412) | | | (0.620) | | | (0.738) |
| $f(\boldsymbol{age}_{i,t}) \cdot \boldsymbol{p10\_15}_{i,t}$ | | | **0.0021** | | | **-0.0007** | | | **0.0010** |
| | | | (0.790) | | | (0.971) | | | (0.935) |
| $f(\boldsymbol{age}_{i,t}) \cdot \boldsymbol{p15\_20}_{i,t}$ | | | **-0.0001** | | | **-0.0124*** | | | **-0.0119**** |
| | | | (0.989) | | | (0.094) | | | (0.047) |
| $f(\boldsymbol{age}_{i,t}) \cdot \boldsymbol{Size}_{i,t-1}$ | | | **-0.0034*** | | | **-0.0060** | | | **-0.0043*** |
| | | | (0.055) | | | (0.113) | | | (0.096) |
| $f(\boldsymbol{age}_{i,t}) \cdot \boldsymbol{Bear}_{i,t}$ | | | **0.0119**** | | | **0.0126** | | | **0.0036** |
| | | | (0.022) | | | (0.116) | | | (0.476) |
| $f(\boldsymbol{age}_{i,t}) \cdot \boldsymbol{Bull}_{i,t}$ | | | **-0.0018** | | | **-0.0102*** | | | **-0.0086**** |
| | | | (0.580) | | | (0.073) | | | (0.040) |
| $\boldsymbol{PPP}_{t}$ | | **-0.0692** | **-0.0765** | | **0.0753** | **0.0509** | | **0.1856** | **0.1415** |
| | | (0.660) | (0.633) | | (0.814) | (0.876) | | (0.213) | (0.327) |
| $\boldsymbol{STK}_{t}$ | | **-0.1532** | **-0.1158** | | **0.0833** | **0.1333** | | **0.0832** | **0.1152** |
| | | (0.460) | (0.536) | | (0.389) | (0.162) | | (0.372) | (0.216) |
| $R^2$ within | 0.0181 | 0.1126 | 0.1280 | 0.0190 | 0.0219 | 0.0308 | 0.0184 | 0.0348 | 0.0417 |
| F-statistic | 4.4304 | 21.9480 | 40.5513 | 9.0678 | 9.8590 | 19.3564 | 15.2117 | 5.5752 | 14.5175 |
| p-value | 0.0015 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0000 |
| Funds | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 |
| Observations | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 |

Table F1.D. Results for the equity funds sample with $f(age_{i,t}) = age_{i,t}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **0.0139** | **0.1451** | **0.1370** | **-0.0701** | **-0.0623** | **-0.0414** | **-0.1890** | **0.1410** | **0.1368** |
| | (0.930) | (0.155) | (0.163) | (0.480) | (0.858) | (0.906) | (0.138) | (0.658) | (0.678) |
| $\boldsymbol{f(age_{i,t})}$ | **-0.0087** | **-0.0042** | **-0.0049** | **-0.0057** | **0.0027** | **0.0016** | **0.0035** | **0.0161*** | **0.0155** |
| | (0.544) | (0.593) | (0.591) | (0.462) | (0.769) | (0.888) | (0.619) | (0.082) | (0.184) |
| $\boldsymbol{Bear_{i,t}}$ | | **-0.5804***** | **-0.6112***** | | **-0.0168** | **-0.0637** | | **-0.0934** | **-0.1350*** |
| | | (0.000) | (0.000) | | (0.802) | (0.390) | | (0.164) | (0.092) |
| $\boldsymbol{Bull_{i,t}}$ | | **0.0499** | **0.0476** | | **0.0325** | **0.0374** | | **-0.2027***** | **-0.1959**** |
| | | (0.518) | (0.505) | | (0.587) | (0.605) | | (0.004) | (0.023) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0204** | **0.0157** | **0.0262*** | **0.0173** | **0.0172** | **0.0307*** | **0.0558**** | **0.0320*** | **0.0442** |
| | (0.537) | (0.104) | (0.087) | (0.173) | (0.190) | (0.094) | (0.010) | (0.081) | (0.112) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0097**** | **0.0018** | **0.0011** | **0.0091*** | **0.0081*** | **0.0068** | **-0.0049** | **-0.0020** | **-0.0029** |
| | (0.049) | (0.522) | (0.698) | (0.054) | (0.073) | (0.119) | (0.367) | (0.678) | (0.546) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0022** | **-0.0022** | **-0.0024** | **0.0194**** | **0.0198**** | **0.0193**** | **0.0227***** | **0.0243***** | **0.0239***** |
| | (0.710) | (0.595) | (0.564) | (0.013) | (0.016) | (0.014) | (0.002) | (0.003) | (0.003) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.0414** | **-0.0396** | **-0.1028** | **-0.0381** | **0.0092** | **-0.1768** | **0.2360** | **0.2219** | **0.1961** |
| | (0.856) | (0.654) | (0.356) | (0.875) | (0.964) | (0.523) | (0.287) | (0.230) | (0.435) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.1535** | **-0.0385** | **-0.0516** | **-0.3031*** | **-0.2685*** | **-0.4553**** | **0.0306** | **-0.0321** | **-0.0788** |
| | (0.433) | (0.588) | (0.546) | (0.089) | (0.059) | (0.032) | (0.836) | (0.795) | (0.671) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.0763** | **-0.0178** | **-0.0701** | **-0.1362** | **-0.1275** | **-0.2829*** | **0.0592** | **0.0402** | **-0.0758** |
| | (0.673) | (0.805) | (0.470) | (0.277) | (0.256) | (0.094) | (0.578) | (0.680) | (0.631) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.0594** | **0.0039** | **-0.0174** | **-0.0332** | **-0.0368** | **-0.0558** | **0.1261** | **0.0678** | **0.0483** |
| | (0.533) | (0.918) | (0.701) | (0.690) | (0.657) | (0.565) | (0.102) | (0.210) | (0.475) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | | | **0.0353** | | | **0.0983** | | | **0.0282** |
| | | | (0.122) | | | (0.131) | | | (0.546) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | | | **0.0068** | | | **0.0520*** | | | **0.0172** |
| | | | (0.521) | | | (0.075) | | | (0.527) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | | | **0.0084** | | | **0.0236**** | | | **0.0184** |
| | | | (0.159) | | | (0.044) | | | (0.184) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | | | **0.0026** | | | **0.0022** | | | **0.0024** |
| | | | (0.344) | | | (0.695) | | | (0.640) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | | | **-0.0008*** | | | **-0.0011** | | | **-0.0010** |
| | | | (0.089) | | | (0.116) | | | (0.292) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | | | **0.0052**** | | | **0.0082** | | | **0.0071** |
| | | | (0.040) | | | (0.103) | | | (0.177) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | | | **0.0009** | | | **0.0002** | | | **-0.0003** |
| | | | (0.732) | | | (0.965) | | | (0.965) |
| $\boldsymbol{PPP_t}$ | | **-0.0065** | **-0.0147** | | **0.0388** | **-0.0018** | | **-0.1316** | **-0.1479** |
| | | (0.938) | (0.862) | | (0.896) | (0.995) | | (0.620) | (0.577) |
| $\boldsymbol{STK_t}$ | | **0.0271** | **0.0339** | | **-0.1339** | **-0.1179** | | **-0.1328** | **-0.1229** |
| | | (0.732) | (0.673) | | (0.251) | (0.326) | | (0.276) | (0.313) |
| $R^2$ within | 0.0115 | 0.5415 | 0.5442 | 0.0067 | 0.0088 | 0.0114 | 0.0227 | 0.0398 | 0.0414 |
| F-statistic | 1.5920 | 45.0352 | 207.8231 | 2.1881 | 1.9413 | 6.7906 | 2.3386 | 8.1532 | 35.4994 |
| p-value | 0.1721 | 0.0000 | 0.0000 | 0.0600 | 0.0726 | 0.0000 | 0.0460 | 0.0000 | 0.0000 |
| Funds | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 |
| Observations | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 |

Table F1.E. Results for the emerging equity funds sample with $f(age_{i,t}) = age_{i,t}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.4782*** | **-0.1002** | **-0.1276** | **-0.4064*** | **-0.1395** | **-0.6250***** | **-0.8388***** | **-0.0411** | **-0.4633*** |
| | (0.072) | (0.628) | (0.535) | (0.092) | (0.455) | (0.008) | (0.009) | (0.882) | (0.071) |
| $f(age_{i,t})$ | **0.0068** | **0.0471***** | **0.0433**** | **-0.0136** | **0.0138** | **0.0294** | **-0.0430*** | **0.0162** | **0.0224** |
| | (0.861) | (0.010) | (0.029) | (0.508) | (0.643) | (0.443) | (0.099) | (0.610) | (0.598) |
| $\boldsymbol{Bear_{i,t}}$ | | **-0.8190***** | **-0.8591***** | | **-0.0720** | **-0.0273** | | **-0.4608***** | **-0.4463***** |
| | | (0.000) | (0.000) | | (0.281) | (0.817) | | (0.000) | (0.000) |
| $\boldsymbol{Bull_{i,t}}$ | | **0.0357** | **0.0510** | | **0.2561*** | **0.4740**** | | **-0.2172** | **-0.0623** |
| | | (0.535) | (0.252) | | (0.086) | (0.048) | | (0.192) | (0.759) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0949** | **0.0240**** | **0.0364**** | **0.0958***** | **0.0924**** | **0.2508***** | **0.2403***** | **0.1779***** | **0.3322***** |
| | (0.123) | (0.049) | (0.031) | (0.008) | (0.002) | (0.000) | (0.000) | (0.000) | (0.000) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0159***** | **0.0032** | **0.0015** | **0.0047** | **0.0003** | **-0.0119*** | **0.0069** | **0.0046** | **-0.0087** |
| | (0.000) | (0.196) | (0.578) | (0.377) | (0.956) | (0.097) | (0.363) | (0.522) | (0.285) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0066** | **0.0223**** | **0.0256**** | **0.0308** | **0.0355** | **0.0370** | **0.0401** | **0.0327** | **0.0373** |
| | (0.548) | (0.035) | (0.047) | (0.370) | (0.354) | (0.187) | (0.310) | (0.294) | (0.126) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.1078** | **0.7385***** | **0.7476***** | **-0.0937** | **-0.0466** | **0.4191** | **-0.3590** | **-0.0071** | **0.4196** |
| | (0.779) | (0.001) | (0.001) | (0.860) | (0.933) | (0.376) | (0.636) | (0.991) | (0.434) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.3490** | **0.6277***** | **0.0479** | **-0.7318** | **-0.4417** | **-1.2782** | **-0.5847** | **-0.2492** | **-1.2231** |
| | (0.469) | (0.002) | (0.869) | (0.159) | (0.419) | (0.158) | (0.423) | (0.694) | (0.347) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.3954** | **0.4099*** | **0.3368** | **-0.6573** | **-0.5370** | **-0.5793** | **-0.8479*** | **-0.6804*** | **-1.0498**** |
| | (0.389) | (0.061) | (0.138) | (0.110) | (0.233) | (0.258) | (0.098) | (0.082) | (0.012) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.1727** | **0.1958** | **0.1468** | **-0.4936*** | **-0.4910**** | **-0.5674**** | **-0.4895** | **-0.5809**** | **-0.6821**** |
| | (0.464) | (0.365) | (0.599) | (0.063) | (0.031) | (0.032) | (0.209) | (0.015) | (0.024) |
| $f(age_{i,t}) \cdot \boldsymbol{p0\_5_{i,t}}$ | | | **0.1168** | | | **-0.1191** | | | **0.0733** |
| | | | (0.217) | | | (0.144) | | | (0.257) |
| $f(age_{i,t}) \cdot \boldsymbol{p5\_10_{i,t}}$ | | | **0.3015**** | | | **0.5561*** | | | **0.6516** |
| | | | (0.018) | | | (0.060) | | | (0.163) |
| $f(age_{i,t}) \cdot \boldsymbol{p10\_15_{i,t}}$ | | | **0.0205** | | | **0.0464** | | | **0.1184***** |
| | | | (0.199) | | | (0.451) | | | (0.003) |
| $f(age_{i,t}) \cdot \boldsymbol{p15\_20_{i,t}}$ | | | **0.0056** | | | **0.0068** | | | **0.0089** |
| | | | (0.762) | | | (0.852) | | | (0.843) |
| $f(age_{i,t}) \cdot \boldsymbol{Size_{i,t-1}}$ | | | **-0.0012** | | | **-0.0141***** | | | **-0.0141***** |
| | | | (0.279) | | | (0.001) | | | (0.000) |
| $f(age_{i,t}) \cdot \boldsymbol{Bear_{i,t}}$ | | | **0.0112** | | | **0.0150** | | | **0.0192** |
| | | | (0.201) | | | (0.438) | | | (0.413) |
| $f(age_{i,t}) \cdot \boldsymbol{Bull_{i,t}}$ | | | **-0.0017** | | | **-0.0206** | | | **-0.0093** |
| | | | (0.762) | | | (0.216) | | | (0.528) |
| $\boldsymbol{PPP_t}$ | | | | | | | | | |
| $\boldsymbol{STK_t}$ | | **0.0005** | **0.0213** | | **-0.4641** | **-0.4154** | | **-0.5303** | **-0.4709** |
| | | (0.998) | (0.913) | | (0.237) | (0.195) | | (0.252) | (0.264) |
| $R^2$ within | 0.1250 | 0.7943 | 0.8030 | 0.0512 | 0.0799 | 0.1296 | 0.2169 | 0.2759 | 0.3290 |
| F-statistic | 18.5767 | 318.1808 | 10639336.15 | 16.0301 | 114.8481 | 434.6461 | 5.4551 | 20.8636 | 155969.07 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0008 | 0.0000 | 0.0000 |
| Funds | 183 | 183 | 183 | 183 | 183 | 183 | 183 | 183 | 183 |
| Observations | 713 | 713 | 713 | 713 | 713 | 713 | 713 | 713 | 713 |

Table F1.F. Results for the international equity funds sample with $f(age_{i,t}) = age_{i,t}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.1404** | **0.1236** | **0.1246** | **-0.3207**** | **-0.4335** | **-0.3847** | **-0.3488**** | **0.1020** | **0.1122** |
| | (0.431) | (0.315) | (0.332) | (0.022) | (0.225) | (0.269) | (0.014) | (0.754) | (0.717) |
| $f(age_{i,t})$ | **-0.0055** | **0.0031** | **0.0033** | **-0.0085** | **0.0061** | **0.0064** | **-0.0037** | **0.0159** | **0.0187** |
| | (0.622) | (0.737) | (0.753) | (0.441) | (0.653) | (0.661) | (0.650) | (0.173) | (0.156) |
| $Bear_{i,t}$ | | **-0.4451***** | **-0.4701***** | | **-0.1161** | **-0.1904** | | **-0.2563**** | **-0.3090***** |
| | | (0.000) | (0.000) | | (0.419) | (0.199) | | (0.023) | (0.005) |
| $Bull_{i,t}$ | | **0.1149*** | **0.1187*** | | **0.0243** | **0.0261** | | **-0.2326***** | **-0.2069***** |
| | | (0.093) | (0.076) | | (0.777) | (0.648) | | (0.008) | (0.003) |
| $Size_{i,t-1}$ | **0.0214** | **0.0234**** | **0.0390**** | **0.0455*** | **0.0436**** | **0.0735***** | **0.0886***** | **0.0561***** | **0.0810***** |
| | (0.408) | (0.022) | (0.013) | (0.063) | (0.018) | (0.001) | (0.003) | (0.002) | (0.000) |
| $Share_{i,t-1}$ | **0.0060** | **-0.0025** | **-0.0042** | **0.0244** | **0.0218** | **0.0179** | **-0.0056** | **0.0012** | **-0.0017** |
| | (0.528) | (0.625) | (0.413) | (0.121) | (0.113) | (0.193) | (0.720) | (0.923) | (0.886) |
| $ABIshare_{i,t-1}$ | **0.0171*** | **0.0073*** | **0.0061** | **0.0345***** | **0.0287**** | **0.0250**** | **0.0394***** | **0.0301**** | **0.0278**** |
| | (0.067) | (0.084) | (0.155) | (0.002) | (0.015) | (0.018) | (0.004) | (0.012) | (0.012) |
| $p0\_5_{i,t}$ | **-0.0336** | **-0.0338** | **-0.1309** | **-0.3101** | **-0.1594** | **-0.2875** | **0.0080** | **0.0859** | **0.0646** |
| | (0.867) | (0.699) | (0.408) | (0.308) | (0.553) | (0.495) | (0.975) | (0.703) | (0.879) |
| $p5\_10_{i,t}$ | **-0.0978** | **-0.0097** | **-0.0659** | **-0.4032*** | **-0.3070** | **-0.5657**** | **-0.1099** | **-0.1017** | **-0.3008** |
| | (0.534) | (0.894) | (0.488) | (0.075) | (0.112) | (0.029) | (0.483) | (0.475) | (0.153) |
| $p10\_15_{i,t}$ | **-0.0252** | **0.0044** | **-0.0207** | **-0.1230** | **-0.0922** | **-0.1013** | **0.0691** | **0.0873** | **0.1462** |
| | (0.874) | (0.952) | (0.860) | (0.477) | (0.523) | (0.643) | (0.574) | (0.402) | (0.486) |
| $p15\_20_{i,t}$ | **-0.0246** | **0.0012** | **-0.0036** | **-0.0203** | **-0.0298** | **-0.0092** | **0.1386** | **0.0817** | **0.1143** |
| | (0.784) | (0.977) | (0.948) | (0.878) | (0.808) | (0.946) | (0.217) | (0.322) | (0.323) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.0479** | | | **0.0755** | | | **0.0219** |
| | | | (0.146) | | | (0.434) | | | (0.826) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0162** | | | **0.0688*** | | | **0.0519** |
| | | | (0.200) | | | (0.070) | | | (0.100) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0031** | | | **-0.0015** | | | **-0.0121** |
| | | | (0.755) | | | (0.938) | | | (0.551) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.0002** | | | **-0.0036** | | | **-0.0049** |
| | | | (0.969) | | | (0.735) | | | (0.556) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0012**** | | | **-0.0024***** | | | **-0.0020**** |
| | | | (0.024) | | | (0.006) | | | (0.010) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0043** | | | **0.0119*** | | | **0.0087** |
| | | | (0.165) | | | (0.086) | | | (0.190) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **0.0002** | | | **0.0010** | | | **-0.0023** |
| | | | (0.948) | | | (0.842) | | | (0.710) |
| $PPP_t$ | | **-0.0791** | **-0.1009** | | **0.2871** | **0.2173** | | **-0.1153** | **-0.1658** |
| | | (0.429) | (0.310) | | (0.310) | (0.431) | | (0.660) | (0.517) |
| $STK_t$ | | **-0.1045** | **-0.0949** | | **-0.2485** | **-0.2294** | | **-0.2110**** | **-0.1984**** |
| | | (0.263) | (0.318) | | (0.103) | (0.132) | | (0.034) | (0.037) |
| $R^2$ within | 0.0148 | 0.4799 | 0.4834 | 0.0195 | 0.0323 | 0.0367 | 0.0401 | 0.0701 | 0.0739 |
| F-statistic | 5.3172 | 38.1154 | 187.5816 | 3.1922 | 4.2399 | 23.1701 | 3.1425 | 3.6829 | 22.8562 |
| p-value | 0.0004 | 0.0000 | 0.0000 | 0.0106 | 0.0008 | 0.0000 | 0.0115 | 0.0022 | 0.0000 |
| Funds | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 |
| Observations | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 |

Table F1.G. Results for the UK equity funds sample with $f(age_{i,t}) = age_{i,t}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **0.2164** | **0.1053** | **0.0789** | **0.1226** | **0.4386** | **0.4898** | **0.0207** | **0.4016** | **0.4716** |
| | (0.173) | (0.423) | (0.552) | (0.464) | (0.348) | (0.311) | (0.907) | (0.341) | (0.280) |
| $f(age_{i,t})$ | **-0.0057** | **-0.0150** | **-0.0145** | **0.0105** | **0.0121** | **0.0077** | **0.0245**** | **0.0310*** | **0.0243** |
| | (0.764) | (0.103) | (0.119) | (0.206) | (0.497) | (0.669) | (0.036) | (0.080) | (0.187) |
| $\boldsymbol{Bear_{i,t}}$ | | **-0.7387***** | **-0.7423***** | | **0.1305*** | **0.1026** | | **0.1514** | **0.1015** |
| | | (0.000) | (0.000) | | (0.075) | (0.169) | | (0.266) | (0.467) |
| $\boldsymbol{Bull_{i,t}}$ | | **-0.0260** | **-0.0194** | | **0.0261** | **0.0168** | | **-0.1702** | **-0.2072** |
| | | (0.772) | (0.803) | | (0.797) | (0.896) | | (0.126) | (0.101) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0087** | **0.0042** | **0.0109** | **-0.0452***** | **-0.0452**** | **-0.0595**** | **-0.0096** | **-0.0284** | **-0.0469** |
| | (0.842) | (0.772) | (0.628) | (0.001) | (0.020) | (0.025) | (0.641) | (0.266) | (0.186) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0193***** | **0.0066** | **0.0062** | **0.0133**** | **0.0153**** | **0.0156**** | **-0.0015** | **0.0064** | **0.0073** |
| | (0.003) | (0.110) | (0.160) | (0.045) | (0.038) | (0.042) | (0.831) | (0.391) | (0.335) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0208*** | **-0.0138**** | **-0.0133**** | **0.0066** | **0.0022** | **0.0041** | **0.0075** | **0.0055** | **0.0069** |
| | (0.092) | (0.020) | (0.025) | (0.549) | (0.823) | (0.692) | (0.403) | (0.422) | (0.346) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.0466** | **-0.0620** | **-0.0487** | **0.3880** | **0.2356** | **0.0054** | **0.6155**** | **0.4860**** | **0.4667*** |
| | (0.877) | (0.642) | (0.675) | (0.117) | (0.335) | (0.983) | (0.013) | (0.028) | (0.061) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.2178** | **-0.0926** | **-0.0276** | **-0.0462** | **-0.1432** | **-0.0808** | **0.2918** | **0.1296** | **0.3377** |
| | (0.411) | (0.376) | (0.828) | (0.777) | (0.274) | (0.669) | (0.119) | (0.423) | (0.113) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.1520** | **-0.0646** | **-0.1574*** | **-0.0823** | **-0.1055** | **-0.3729***** | **0.0766** | **0.0160** | **-0.2815*** |
| | (0.487) | (0.438) | (0.076) | (0.369) | (0.353) | (0.007) | (0.539) | (0.904) | (0.078) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.1004** | **0.0212** | **-0.0185** | **-0.0094** | **-0.0194** | **-0.0517** | **0.1438***** | **0.0633** | **0.0056** |
| | (0.363) | (0.664) | (0.709) | (0.853) | (0.681) | (0.459) | (0.007) | (0.212) | (0.923) |
| $f(age_{i,t}) \cdot \boldsymbol{p0\_5_{i,t}}$ | | | **0.0076** | | | **0.0919** | | | **0.0144** |
| | | | (0.775) | | | (0.251) | | | (0.836) |
| $f(age_{i,t}) \cdot \boldsymbol{p5\_10_{i,t}}$ | | | **-0.0096** | | | **-0.0120** | | | **-0.0427** |
| | | | (0.535) | | | (0.736) | | | (0.276) |
| $f(age_{i,t}) \cdot \boldsymbol{p10\_15_{i,t}}$ | | | **0.0160***** | | | **0.0424***** | | | **0.0494***** |
| | | | (0.002) | | | (0.002) | | | (0.000) |
| $f(age_{i,t}) \cdot \boldsymbol{p15\_20_{i,t}}$ | | | **0.0056** | | | **0.0040** | | | **0.0078** |
| | | | (0.169) | | | (0.632) | | | (0.362) |
| $f(age_{i,t}) \cdot \boldsymbol{Size_{i,t-1}}$ | | | **-0.0005** | | | **0.0012*** | | | **0.0015** |
| | | | (0.457) | | | (0.094) | | | (0.143) |
| $f(age_{i,t}) \cdot \boldsymbol{Bear_{i,t}}$ | | | **0.0006** | | | **0.0041** | | | **0.0069**** |
| | | | (0.822) | | | (0.293) | | | (0.048) |
| $f(age_{i,t}) \cdot \boldsymbol{Bull_{i,t}}$ | | | **-0.0008** | | | **0.0011** | | | **0.0047** |
| | | | (0.804) | | | (0.833) | | | (0.209) |
| $\boldsymbol{PPP_t}$ | | **0.1378** | **0.1382** | | **-0.3299** | **-0.3391** | | **-0.2794** | **-0.2771** |
| | | (0.228) | (0.229) | | (0.390) | (0.373) | | (0.434) | (0.437) |
| $\boldsymbol{STK_t}$ | | **0.2709***** | **0.2761***** | | **0.0041** | **-0.0077** | | **-0.0602** | **-0.0776** |
| | | (0.009) | (0.007) | | (0.986) | (0.974) | | (0.781) | (0.717) |
| $R^2$ within | 0.0222 | 0.6405 | 0.6423 | 0.0111 | 0.0180 | 0.0209 | 0.0103 | 0.0476 | 0.0528 |
| F-statistic | 2.8310 | 62.3301 | 142.8285 | 10.1027 | 23.8794 | 48.4538 | 3.8879 | 10.5937 | 74.5793 |
| p-value | 0.0195 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0034 | 0.0000 | 0.0000 |
| Funds | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 |
| Observations | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 |

Table F2.A. Results for the all-funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0957** | **0.0816** | **0.0328** | **-0.1022** | **0.0086** | **-0.0579** | **-0.2082** | **0.1078** | **0.0884** |
| | (0.652) | (0.360) | (0.724) | (0.406) | (0.979) | (0.864) | (0.271) | (0.676) | (0.751) |
| $f(age_{i,t})$ | **0.0205** | **0.0485** | **0.0567** | **0.0442** | **0.0659** | **0.0421** | **0.0839*** | **0.0863** | **0.0681** |
| | (0.823) | (0.288) | (0.382) | (0.216) | (0.128) | (0.490) | (0.071) | (0.111) | (0.402) |
| $Bear_{i,t}$ | | **-0.5290*** ** | **-0.5702*** ** | | **0.0488** | **-0.0746** | | **-0.0440** | **-0.1643** |
| | | (0.000) | (0.000) | | (0.250) | (0.276) | | (0.435) | (0.122) |
| $Bull_{i,t}$ | | **0.0688** | **0.1326*** | | **0.0579** | **0.1169** | | **-0.1442*** * | **-0.1238** |
| | | (0.336) | (0.075) | | (0.353) | (0.238) | | (0.023) | (0.267) |
| $Size_{i,t-1}$ | **0.0097** | **0.0141** | **0.0450*** * | **0.0093** | **0.0167** | **0.1170*** ** | **0.0374*** | **0.0308** | **0.0812*** * |
| | (0.701) | (0.335) | (0.031) | (0.550) | (0.350) | (0.003) | (0.094) | (0.152) | (0.019) |
| $Share_{i,t-1}$ | **0.0065*** * | **0.0007** | **-0.0003** | **0.0075*** * | **0.0063*** * | **0.0029** | **0.0005** | **0.0008** | **-0.0009** |
| | (0.026) | (0.771) | (0.881) | (0.018) | (0.031) | (0.314) | (0.893) | (0.809) | (0.773) |
| $ABIshare_{i,t-1}$ | **0.0010** | **0.0002** | **0.0000** | **0.0135*** ** | **0.0125*** ** | **0.0113*** ** | **0.0147*** * | **0.0142*** | **0.0135*** |
| | (0.728) | (0.933) | (0.995) | (0.002) | (0.003) | (0.005) | (0.046) | (0.059) | (0.074) |
| $p0\_5_{i,t}$ | **0.1238** | **0.0593** | **-0.1106** | **0.2010** | **0.1020** | **-0.2538** | **0.3304*** | **0.1441** | **0.0034** |
| | (0.590) | (0.558) | (0.404) | (0.290) | (0.543) | (0.395) | (0.090) | (0.431) | (0.990) |
| $p5\_10_{i,t}$ | **0.0205** | **0.0656** | **0.0497** | **-0.0989** | **-0.1739** | **-0.5728*** * | **0.1082** | **-0.0732** | **-0.2333** |
| | (0.916) | (0.405) | (0.692) | (0.576) | (0.241) | (0.028) | (0.400) | (0.571) | (0.349) |
| $p10\_15_{i,t}$ | **0.0485** | **0.0576** | **-0.0045** | **0.0354** | **-0.0197** | **-0.3386*** | **0.1383** | **0.0323** | **-0.1500** |
| | (0.743) | (0.386) | (0.971) | (0.669) | (0.822) | (0.065) | (0.145) | (0.730) | (0.484) |
| $p15\_20_{i,t}$ | **0.0280** | **0.0572** | **0.0310** | **0.0524** | **0.0135** | **-0.0320** | **0.1381*** | **0.0488** | **0.0598** |
| | (0.800) | (0.228) | (0.710) | (0.441) | (0.853) | (0.807) | (0.084) | (0.410) | (0.494) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.1338*** | | | **0.2928** | | | **0.1126** |
| | | | (0.059) | | | (0.100) | | | (0.352) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0091** | | | **0.2487*** * | | | **0.0976** |
| | | | (0.900) | | | (0.021) | | | (0.397) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0284** | | | **0.1468*** * | | | **0.0843** |
| | | | (0.544) | | | (0.029) | | | (0.329) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.0102** | | | **0.0098** | | | **-0.0129** |
| | | | (0.757) | | | (0.832) | | | (0.696) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0109** | | | **-0.0352*** ** | | | **-0.0180*** |
| | | | (0.143) | | | (0.005) | | | (0.065) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0271** | | | **0.0774*** * | | | **0.0725** |
| | | | (0.351) | | | (0.024) | | | (0.113) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0330** | | | **-0.0309** | | | **-0.0102** |
| | | | (0.290) | | | (0.353) | | | (0.818) |
| $PPP_t$ | | **-0.0727** | **-0.0798** | | **-0.0782** | **-0.1027** | | **-0.1220** | **-0.1313** |
| | | (0.334) | (0.287) | | (0.782) | (0.711) | | (0.538) | (0.503) |
| $STK_t$ | | **-0.0453** | **-0.0402** | | **-0.1305** | **-0.1020** | | **-0.0962** | **-0.0841** |
| | | (0.530) | (0.598) | | (0.171) | (0.307) | | (0.334) | (0.425) |
| $R^2$ within | 0.0065 | 0.3976 | 0.4007 | 0.0048 | 0.0068 | 0.0112 | 0.0152 | 0.0240 | 0.0261 |
| F-statistic | 1.9097 | 28.3148 | 142.6025 | 2.2074 | 1.5467 | 216.5180 | 1.1791 | 5.7482 | 27.3715 |
| p-value | 0.0983 | 0.0000 | 0.0000 | 0.0580 | 0.1659 | 0.0000 | 0.3460 | 0.0001 | 0.0000 |
| Funds | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 |
| Observations | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 |

Table F2.B. Results for the allocation funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| $\boldsymbol{Constant}$ | **-0.1134** | **-0.0119** | **-0.1852** | **0.0406** | **-0.8393*****| **-1.4998***** | **-0.1834** | **-0.5408**** | **-0.7335*** |
| | (0.708) | (0.937) | (0.185) | (0.886) | (0.008) | (0.000) | (0.541) | (0.020) | (0.059) |
| $\boldsymbol{f(age_{i,t})}$ | **-0.0537** | **-0.0361** | **0.0012** | **-0.0316** | **-0.0354** | **0.1795** | **0.0793** | **0.0577** | **0.1555** |
| | (0.628) | (0.585) | (0.989) | (0.653) | (0.646) | (0.275) | (0.366) | (0.586) | (0.512) |
| $\boldsymbol{Bear_{i,t}}$ | | **-0.6503***** | **-0.6050***** | | **0.3559***** | **0.5747***** | | **-0.0524** | **-0.0499** |
| | | (0.000) | (0.000) | | (0.001) | (0.001) | | (0.666) | (0.876) |
| $\boldsymbol{Bull_{i,t}}$ | | **-0.0339** | **-0.0161** | | **0.3063** | **0.3962*** | | **-0.0999** | **-0.2148** |
| | | (0.771) | (0.898) | | (0.134) | (0.097) | | (0.512) | (0.500) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0481** | **0.0359** | **0.1382***** | **0.0527** | **0.0951** | **0.3016***** | **0.0835**** | **0.0679** | **0.0561** |
| | (0.248) | (0.131) | (0.001) | (0.136) | (0.139) | (0.000) | (0.032) | (0.129) | (0.347) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0018** | **-0.0117** | **-0.0169*** | **-0.0311**** | **-0.0393** | **-0.0442*** | **-0.0293*** | **-0.0193** | **-0.0144** |
| | (0.882) | (0.242) | (0.093) | (0.019) | (0.129) | (0.097) | (0.090) | (0.259) | (0.386) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0109** | **0.0201** | **0.0193** | **0.0285** | **0.0404** | **0.0391** | **0.0222** | **0.0147** | **0.0121** |
| | (0.624) | (0.160) | (0.163) | (0.426) | (0.372) | (0.377) | (0.485) | (0.658) | (0.708) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.0788** | **0.1606** | **0.4851** | **-0.0610** | **0.0527** | **1.2482**** | **0.3667** | **0.4539*** | **1.0600*** |
| | (0.804) | (0.152) | (0.273) | (0.758) | (0.777) | (0.032) | (0.107) | (0.052) | (0.076) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.0454** | **0.1288** | **0.0041** | **-0.4175** | **-0.3074** | **-0.0772** | **0.0313** | **0.1394** | **0.3297** |
| | (0.864) | (0.315) | (0.981) | (0.112) | (0.162) | (0.836) | (0.855) | (0.413) | (0.472) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.0320** | **0.1205** | **-0.0601** | **0.0804** | **0.1583** | **0.8095** | **0.3175*** | **0.3459**** | **1.1668*** |
| | (0.825) | (0.108) | (0.771) | (0.710) | (0.389) | (0.171) | (0.065) | (0.029) | (0.081) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.0588** | **0.0782** | **0.2790** | **-0.0053** | **0.1460** | **0.8994**** | **0.2325** | **0.2419*** | **1.1497***** |
| | (0.758) | (0.353) | (0.129) | (0.968) | (0.382) | (0.015) | (0.112) | (0.071) | (0.003) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | | | **-0.2681** | | | **-1.1174***** | | | **-0.7812**** |
| | | | (0.347) | | | (0.008) | | | (0.014) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | | | **0.0487** | | | **-0.3246** | | | **-0.3623** |
| | | | (0.661) | | | (0.287) | | | (0.252) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | | | **0.0577** | | | **-0.4778** | | | **-0.5854** |
| | | | (0.634) | | | (0.134) | | | (0.129) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | | | **-0.1240** | | | **-0.4550***** | | | **-0.5374**** |
| | | | (0.173) | | | (0.009) | | | (0.020) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | | | **-0.0388***** | | | **-0.0855***** | | | **-0.0058** |
| | | | (0.000) | | | (0.000) | | | (0.858) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | | | **-0.0260** | | | **-0.1302** | | | **-0.0087** |
| | | | (0.283) | | | (0.124) | | | (0.953) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | | | **-0.0121** | | | **-0.0527** | | | **0.0652** |
| | | | (0.717) | | | (0.591) | | | (0.668) |
| $\boldsymbol{PPP_t}$ | | **-0.0072** | **-0.0177** | | **0.5198** | **0.6011*** | | **0.3832** | **0.5428**** |
| | | (0.967) | (0.906) | | (0.162) | (0.072) | | (0.191) | (0.047) |
| $\boldsymbol{STK_t}$ | | **0.1088** | **0.1214** | | **-0.1008** | **-0.0808** | | **0.1367** | **0.1255** |
| | | (0.352) | (0.284) | | (0.672) | (0.728) | | (0.552) | (0.571) |
| $R^2$ within | 0.0244 | 0.5045 | 0.5124 | 0.0182 | 0.0489 | 0.0627 | 0.0435 | 0.0468 | 0.0587 |
| F-statistic | 1.5271 | 42.7644 | 95.0872 | 2.6807 | 26.5445 | 86.8749 | 2.0837 | 5.5503 | 93.6212 |
| p-value | 0.2023 | 0.0000 | 0.0000 | 0.0306 | 0.0000 | 0.0000 | 0.0806 | 0.0002 | 0.0000 |
| Funds | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 |
| Observations | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 |

Table F2.C. Results for the fixed income funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0880** | **-0.0255** | **-0.1471** | **0.0753** | **0.2135** | **-0.1610** | **0.1965** | **0.2709** | **-0.0247** |
| | (0.720) | (0.890) | (0.424) | (0.829) | (0.609) | (0.761) | (0.453) | (0.254) | (0.938) |
| $f(age_{i,t})$ | **-0.0452** | **0.0273** | **0.0538** | **-0.1411** | **-0.1509** | **-0.0641** | **-0.1329** | **-0.1695**** | **-0.1087** |
| | (0.580) | (0.812) | (0.703) | (0.155) | (0.132) | (0.596) | (0.101) | (0.043) | (0.252) |
| $Bear_{i,t}$ | | **-0.2574**** | **-0.4201**** | | **0.1011** | **-0.0913** | | **0.1946***** | **0.2158** |
| | | (0.031) | (0.024) | | (0.373) | (0.690) | | (0.001) | (0.193) |
| $Bull_{i,t}$ | | **0.1301** | **0.1733** | | **-0.0401** | **0.1815** | | **-0.0877*** | **0.0949** |
| | | (0.248) | (0.165) | | (0.506) | (0.197) | | (0.056) | (0.321) |
| $Size_{i,t-1}$ | **0.0342*** | **0.0534***** | **0.1353***** | **0.0755**** | **0.0718**** | **0.3452**** | **0.0599**** | **0.0519*** | **0.3035***** |
| | (0.061) | (0.007) | (0.002) | (0.031) | (0.038) | (0.044) | (0.037) | (0.068) | (0.007) |
| $Share_{i,t-1}$ | **0.0047**** | **0.0031** | **0.0011** | **0.0027** | **0.0023** | **-0.0036** | **0.0001** | **0.0001** | **-0.0051** |
| | (0.044) | (0.213) | (0.708) | (0.684) | (0.721) | (0.514) | (0.978) | (0.990) | (0.237) |
| $ABIshare_{i,t-1}$ | **0.0054** | **-0.0075** | **-0.0094** | **0.0366** | **0.0318** | **0.0204** | **0.0234** | **0.0210** | **0.0078** |
| | (0.742) | (0.454) | (0.346) | (0.139) | (0.150) | (0.309) | (0.140) | (0.184) | (0.551) |
| $p0\_5_{i,t}$ | **-0.2019** | **-0.0829** | **-0.2895** | **0.0163** | **-0.0849** | **-0.2067** | **-0.0424** | **-0.1605** | **-0.6017** |
| | (0.257) | (0.642) | (0.316) | (0.917) | (0.571) | (0.671) | (0.732) | (0.248) | (0.250) |
| $p5\_10_{i,t}$ | **-0.1007** | **-0.0094** | **0.1870** | **-0.1323** | **-0.2206** | **-0.2128** | **-0.1107** | **-0.2119**** | **-0.4768*** |
| | (0.499) | (0.945) | (0.466) | (0.706) | (0.363) | (0.501) | (0.333) | (0.046) | (0.061) |
| $p10\_15_{i,t}$ | **-0.0593** | **-0.0248** | **0.0553** | **0.0772** | **0.0159** | **-0.1353** | **0.0732** | **-0.0034** | **-0.2151** |
| | (0.537) | (0.803) | (0.777) | (0.401) | (0.878) | (0.634) | (0.406) | (0.973) | (0.280) |
| $p15\_20_{i,t}$ | **-0.0147** | **0.0259** | **0.0283** | **0.0958** | **0.0406** | **0.0602** | **0.1025** | **0.0191** | **0.0222** |
| | (0.884) | (0.762) | (0.897) | (0.350) | (0.438) | (0.716) | (0.204) | (0.705) | (0.869) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.1715** | | | **0.1504** | | | **0.3789** |
| | | | (0.192) | | | (0.624) | | | (0.248) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **-0.1111** | | | **0.0049** | | | **0.1555** |
| | | | (0.355) | | | (0.975) | | | (0.265) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **-0.0441** | | | **0.0532** | | | **0.0804** |
| | | | (0.571) | | | (0.608) | | | (0.316) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.0053** | | | **-0.0281** | | | **-0.0200** |
| | | | (0.948) | | | (0.684) | | | (0.726) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0311**** | | | **-0.1014*** | | | **-0.0917***** |
| | | | (0.018) | | | (0.055) | | | (0.006) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0911** | | | **0.1122** | | | **-0.0054** |
| | | | (0.115) | | | (0.253) | | | (0.938) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0195** | | | **-0.1102**** | | | **-0.0934**** |
| | | | (0.612) | | | (0.027) | | | (0.015) |
| $PPP_t$ | | **-0.0879** | **-0.0899** | | **-0.0139** | **-0.0519** | | **0.1069** | **0.0562** |
| | | (0.514) | (0.513) | | (0.966) | (0.875) | | (0.463) | (0.682) |
| $STK_t$ | | **-0.1692** | **-0.1580** | | **-0.0725** | **-0.0292** | | **-0.0646** | **-0.0197** |
| | | (0.312) | (0.363) | | (0.523) | (0.749) | | (0.537) | (0.828) |
| $R^2$ within | 0.0130 | 0.1128 | 0.1224 | 0.0152 | 0.0183 | 0.0310 | 0.0140 | 0.0306 | 0.0445 |
| F-statistic | 5.0675 | 6.8113 | 10.6196 | 7.2388 | 8.5702 | 18.7943 | 13.9311 | 11.6174 | 13.9865 |
| p-value | 0.0006 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 |
| Observations | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 |

Table F2.D. Results for the equity funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0568** | **0.1328** | **0.1492** | **-0.1820** | **-0.1248** | **-0.0419** | **-0.3160*** | **0.0316** | **0.0971** |
| | (0.801) | (0.168) | (0.149) | (0.124) | (0.718) | (0.907) | (0.066) | (0.923) | (0.781) |
| $f(age_{i,t})$ | **0.0247** | **0.0328** | **0.0099** | **0.0715**** | **0.0894**** | **0.0204** | **0.1211**** | **0.1190**** | **0.0854** |
| | (0.803) | (0.367) | (0.836) | (0.050) | (0.022) | (0.696) | (0.019) | (0.036) | (0.325) |
| $Bear_{i,t}$ | | **-0.5780***** | **-0.6418***** | | **-0.0128** | **-0.1773** | | **-0.0902** | **-0.2180** |
| | | (0.000) | (0.000) | | (0.850) | (0.139) | | (0.180) | (0.102) |
| $Bull_{i,t}$ | | **0.0528** | **0.0480** | | **0.0382** | **0.0351** | | **-0.1974***** | **-0.1801** |
| | | (0.484) | (0.548) | | (0.526) | (0.740) | | (0.006) | (0.184) |
| $Size_{i,t-1}$ | **0.0063** | **0.0067** | **0.0254** | **-0.0015** | **0.0056** | **0.0560** | **0.0389*** | **0.0280** | **0.0335** |
| | (0.792) | (0.492) | (0.166) | (0.911) | (0.638) | (0.139) | (0.057) | (0.103) | (0.398) |
| $Share_{i,t-1}$ | **0.0111**** | **0.0025** | **0.0014** | **0.0106**** | **0.0086**** | **0.0055** | **-0.0040** | **-0.0024** | **-0.0032** |
| | (0.031) | (0.426) | (0.621) | (0.023) | (0.046) | (0.215) | (0.468) | (0.621) | (0.487) |
| $ABIshare_{i,t-1}$ | **-0.0030** | **-0.0029** | **-0.0028** | **0.0179**** | **0.0182**** | **0.0178**** | **0.0206***** | **0.0224***** | **0.0220***** |
| | (0.567) | (0.483) | (0.497) | (0.017) | (0.021) | (0.017) | (0.003) | (0.004) | (0.004) |
| $p0\_5_{i,t}$ | **0.1619** | **0.0630** | **-0.0773** | **0.2060** | **0.1207** | **-0.3168** | **0.4172*** | **0.2202** | **0.1356** |
| | (0.521) | (0.496) | (0.508) | (0.345) | (0.569) | (0.302) | (0.066) | (0.269) | (0.638) |
| $p5\_10_{i,t}$ | **-0.0024** | **0.0360** | **-0.0227** | **-0.1279** | **-0.1936** | **-0.6891**** | **0.1505** | **-0.0468** | **-0.1778** |
| | (0.991) | (0.609) | (0.819) | (0.418) | (0.220) | (0.019) | (0.282) | (0.728) | (0.526) |
| $p10\_15_{i,t}$ | **0.0247** | **0.0302** | **-0.0683** | **-0.0258** | **-0.0873** | **-0.4696**** | **0.1236** | **0.0126** | **-0.2120** |
| | (0.886) | (0.675) | (0.576) | (0.802) | (0.457) | (0.033) | (0.251) | (0.908) | (0.401) |
| $p15\_20_{i,t}$ | **-0.0002** | **0.0304** | **-0.0178** | **0.0315** | **-0.0128** | **-0.0912** | **0.1637**** | **0.0570** | **0.0247** |
| | (0.999) | (0.467) | (0.762) | (0.668) | (0.885) | (0.466) | (0.035) | (0.338) | (0.799) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.1103*** | | | **0.3576*** | | | **0.0669** |
| | | | (0.063) | | | (0.058) | | | (0.647) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0358** | | | **0.3179**** | | | **0.0871** |
| | | | (0.537) | | | (0.019) | | | (0.522) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0490** | | | **0.1860**** | | | **0.1160** |
| | | | (0.257) | | | (0.018) | | | (0.265) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.0218** | | | **0.0292** | | | **0.0129** |
| | | | (0.319) | | | (0.567) | | | (0.783) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0061** | | | **-0.0163** | | | **-0.0013** |
| | | | (0.299) | | | (0.250) | | | (0.928) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0379** | | | **0.0986**** | | | **0.0751** |
| | | | (0.108) | | | (0.048) | | | (0.198) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **0.0029** | | | **0.0021** | | | **-0.0090** |
| | | | (0.898) | | | (0.962) | | | (0.880) |
| $PPP_t$ | | **-0.0363** | **-0.0401** | | **0.0096** | **-0.0226** | | **-0.1239** | **-0.1357** |
| | | (0.636) | (0.597) | | (0.974) | (0.937) | | (0.645) | (0.611) |
| $STK_t$ | | **0.0034** | **0.0088** | | **-0.1404** | **-0.1191** | | **-0.0895** | **-0.0856** |
| | | (0.958) | (0.895) | | (0.169) | (0.266) | | (0.388) | (0.434) |
| $R^2$ within | 0.0100 | 0.5418 | 0.5437 | 0.0073 | 0.0098 | 0.0143 | 0.0250 | 0.0408 | 0.0428 |
| F-statistic | 1.4394 | 36.7427 | 185.2879 | 2.0225 | 1.6854 | 25.2323 | 2.4554 | 22.2998 | 19.4512 |
| p-value | 0.2241 | 0.0000 | 0.0000 | 0.0805 | 0.1244 | 0.0000 | 0.0375 | 0.0000 | 0.0000 |
| Funds | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 |
| Observations | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 |

Table F2.E. Results for the emerging equity funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.5312** | **-0.2749** | **-0.1884** | **-0.5956*** | **-0.3391** | **-0.9205***** | **-1.2098***** | **-0.2889** | **-0.6688***** |
| | (0.130) | (0.159) | (0.288) | (0.082) | (0.178) | (0.009) | (0.009) | (0.315) | (0.009) |
| $f(age_{i,t})$ | **0.0830** | **0.2210***** | **0.2395**** | **0.1931** | **0.3661** | **0.4413** | **0.3341*** | **0.4574*** | **0.4603** |
| | (0.621) | (0.006) | (0.024) | (0.140) | (0.107) | (0.154) | (0.077) | (0.059) | (0.138) |
| $Bear_{i,t}$ | | **-0.7935***** | **-0.8816***** | | **-0.0491** | **-0.2876** | | **-0.4325***** | **-0.6356***** |
| | | (0.000) | (0.000) | | (0.497) | (0.179) | | (0.000) | (0.006) |
| $Bull_{i,t}$ | | **0.0691** | **0.2182**** | | **0.3177** | **0.6189** | | **-0.1402** | **0.0782** |
| | | (0.302) | (0.012) | | (0.114) | (0.116) | | (0.522) | (0.837) |
| $Size_{i,t-1}$ | **0.0870**** | **0.0272**** | **-0.0514** | **0.0530**** | **0.0510**** | **0.3650***** | **0.1502***** | **0.1254***** | **0.3505***** |
| | (0.032) | (0.028) | (0.277) | (0.019) | (0.046) | (0.001) | (0.002) | (0.003) | (0.000) |
| $Share_{i,t-1}$ | **0.0156***** | **0.0006** | **0.0036** | **0.0060** | **-0.0007** | **-0.0162*** | **0.0105** | **0.0034** | **-0.0087** |
| | (0.009) | (0.809) | (0.300) | (0.290) | (0.899) | (0.078) | (0.159) | (0.634) | (0.384) |
| $ABIshare_{i,t-1}$ | **-0.0057** | **0.0265**** | **0.0277**** | **0.0337** | **0.0392** | **0.0355** | **0.0455** | **0.0374** | **0.0395*** |
| | (0.620) | (0.028) | (0.028) | (0.308) | (0.262) | (0.143) | (0.164) | (0.153) | (0.094) |
| $p0\_5_{i,t}$ | **0.1910** | **0.7314***** | **0.4959**** | **0.3640** | **0.3953** | **1.2854**** | **0.6083** | **0.5529** | **1.2100**** |
| | (0.581) | (0.000) | (0.012) | (0.590) | (0.528) | (0.038) | (0.473) | (0.388) | (0.036) |
| $p5\_10_{i,t}$ | **-0.3028** | **0.5697***** | **-0.4403** | **-0.3958** | **-0.1334** | **-1.2890** | **0.1485** | **0.1431** | **-1.5382** |
| | (0.479) | (0.002) | (0.246) | (0.497) | (0.818) | (0.402) | (0.842) | (0.820) | (0.433) |
| $p10\_15_{i,t}$ | **-0.3807** | **0.3480*** | **0.3070** | **-0.4791** | **-0.4340** | **-0.1586** | **-0.4440** | **-0.5481** | **-0.8639**** |
| | (0.300) | (0.083) | (0.173) | (0.279) | (0.326) | (0.801) | (0.382) | (0.137) | (0.049) |
| $p15\_20_{i,t}$ | **-0.1696** | **0.1422** | **0.1524** | **-0.3736*** | **-0.4588**** | **-0.3901** | **-0.2071** | **-0.5386**** | **-0.6170** |
| | (0.383) | (0.513) | (0.643) | (0.089) | (0.026) | (0.361) | (0.589) | (0.010) | (0.225) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.2210** | | | **-0.6319***** | | | **-0.2513*** |
| | | | (0.178) | | | (0.000) | | | (0.060) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.8496**** | | | **1.5000** | | | **1.9264** |
| | | | (0.018) | | | (0.174) | | | (0.204) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **-0.0291** | | | **0.0932** | | | **0.4036**** |
| | | | (0.638) | | | (0.776) | | | (0.030) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.0193** | | | **0.0257** | | | **0.0866** |
| | | | (0.857) | | | (0.927) | | | (0.789) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **0.0308** | | | **-0.1254***** | | | **-0.0886**** |
| | | | (0.110) | | | (0.004) | | | (0.034) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0639** | | | **0.2158*** | | | **0.1728** |
| | | | (0.442) | | | (0.089) | | | (0.255) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0901** | | | **-0.1802** | | | **-0.1352** |
| | | | (0.162) | | | (0.213) | | | (0.345) |
| $PPP_t$ | | | | | | | | | |
| $STK_t$ | | **0.0642** | **0.0649** | | **-0.5917** | **-0.5621** | | **-0.6938** | **-0.6414** |
| | | (0.694) | (0.710) | | (0.156) | (0.130) | | (0.154) | (0.168) |
| $R^2$ within | 0.1268 | 0.7958 | 0.8084 | 0.0547 | 0.0923 | 0.1424 | 0.2243 | 0.2956 | 0.3298 |
| F-statistic | 17.4359 | 369.4180 | 518.1603 | 30.2152 | 355.0322 | 2354.6127 | 5.7270 | 39.8726 | 9906.5290 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0006 | 0.0000 | 0.0000 |
| Funds | 183 | 183 | 183 | 183 | 183 | 183 | 183 | 183 | 183 |
| Observations | 713 | 713 | 713 | 713 | 713 | 713 | 713 | 713 | 713 |

Table F2.F. Results for the international equity funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.2230** | **0.0867** | **0.0919** | **-0.4966*** ** | **-0.5028** | **-0.3620** | **-0.5257*** ** | **0.0160** | **0.0891** |
| | (0.316) | (0.430) | (0.492) | (0.005) | (0.147) | (0.302) | (0.007) | (0.960) | (0.764) |
| $f(age_{i,t})$ | **0.0354** | **0.0555** | **0.0502** | **0.0924** | **0.1040*** | **0.0616** | **0.1183*** | **0.1213**** | **0.1197** |
| | (0.642) | (0.118) | (0.344) | (0.124) | (0.054) | (0.389) | (0.061) | (0.044) | (0.167) |
| $Bear_{i,t}$ | | **-0.4427*** ** | **-0.4871*** ** | | **-0.1115** | **-0.3127** | | **-0.2519**** | **-0.3937*** ** |
| | | (0.000) | (0.000) | | (0.435) | (0.116) | | (0.024) | (0.007) |
| $Bull_{i,t}$ | | **0.1184*** | **0.1313*** | | **0.0309** | **0.0685** | | **-0.2263*** ** | **-0.1403** |
| | | (0.077) | (0.094) | | (0.706) | (0.382) | | (0.009) | (0.163) |
| $Size_{i,t-1}$ | **0.0084** | **0.0175*** | **0.0426** | **0.0188** | **0.0329**** | **0.0917** | **0.0631**** | **0.0519*** ** | **0.0790*** |
| | (0.684) | (0.071) | (0.196) | (0.371) | (0.017) | (0.148) | (0.022) | (0.001) | (0.077) |
| $Share_{i,t-1}$ | **0.0090** | **-0.0017** | **-0.0041** | **0.0302**** | **0.0232*** | **0.0161** | **-0.0004** | **0.0008** | **-0.0028** |
| | (0.312) | (0.730) | (0.429) | (0.047) | (0.075) | (0.291) | (0.977) | (0.945) | (0.829) |
| $ABIshare_{i,t-1}$ | **0.0161*** | **0.0053** | **0.0050** | **0.0315*** ** | **0.0250**** | **0.0214**** | **0.0353*** ** | **0.0259**** | **0.0231**** |
| | (0.061) | (0.206) | (0.262) | (0.006) | (0.034) | (0.046) | (0.006) | (0.028) | (0.028) |
| $p0\_5_{i,t}$ | **0.1376** | **0.0241** | **-0.1381** | **0.0340** | **-0.0542** | **-0.4187** | **0.3239** | **0.1016** | **0.0103** |
| | (0.501) | (0.792) | (0.444) | (0.900) | (0.861) | (0.392) | (0.203) | (0.692) | (0.984) |
| $p5\_10_{i,t}$ | **0.0282** | **0.0279** | **-0.0812** | **-0.1536** | **-0.2391** | **-0.8954**** | **0.1136** | **-0.1045** | **-0.5786*** |
| | (0.859) | (0.692) | (0.504) | (0.445) | (0.306) | (0.024) | (0.444) | (0.527) | (0.078) |
| $p10\_15_{i,t}$ | **0.0569** | **0.0221** | **-0.0043** | **0.0357** | **-0.0607** | **-0.1962** | **0.2049** | **0.0654** | **0.1002** |
| | (0.704) | (0.765) | (0.978) | (0.818) | (0.729) | (0.521) | (0.108) | (0.601) | (0.760) |
| $p15\_20_{i,t}$ | **0.0220** | **0.0106** | **0.0309** | **0.0690** | **-0.0130** | **-0.0050** | **0.2137*** | **0.0707** | **0.1120** |
| | (0.822) | (0.805) | (0.696) | (0.584) | (0.926) | (0.979) | (0.059) | (0.429) | (0.497) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.1274** | | | **0.3030** | | | **0.0815** |
| | | | (0.215) | | | (0.258) | | | (0.782) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0660** | | | **0.4256**** | | | **0.3143*** |
| | | | (0.340) | | | (0.028) | | | (0.050) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0063** | | | **0.0465** | | | **-0.0348** |
| | | | (0.921) | | | (0.703) | | | (0.802) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.0135** | | | **-0.0144** | | | **-0.0258** |
| | | | (0.676) | | | (0.854) | | | (0.689) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0087** | | | **-0.0200** | | | **-0.0098** |
| | | | (0.409) | | | (0.351) | | | (0.535) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0268** | | | **0.1176*** | | | **0.0838** |
| | | | (0.276) | | | (0.077) | | | (0.204) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0059** | | | **-0.0188** | | | **-0.0443** |
| | | | (0.810) | | | (0.695) | | | (0.489) |
| $PPP_t$ | | **-0.0977** | **-0.1136** | | **0.2534** | **0.1667** | | **-0.1239** | **-0.1906** |
| | | (0.283) | (0.199) | | (0.354) | (0.516) | | (0.627) | (0.426) |
| $STK_t$ | | **-0.1024** | **-0.0986** | | **-0.2434*** | **-0.2285*** | | **-0.1694*** | **-0.1636*** |
| | | (0.176) | (0.205) | | (0.060) | (0.085) | | (0.058) | (0.073) |
| $R^2$ within | 0.0147 | 0.4818 | 0.4838 | 0.0202 | 0.0335 | 0.0398 | 0.0422 | 0.0711 | 0.0763 |
| F-statistic | 5.3953 | 30.1527 | 105.6986 | 3.0218 | 4.2883 | 62.3107 | 2.8964 | 3.5267 | 26.4655 |
| p-value | 0.0004 | 0.0000 | 0.0000 | 0.0141 | 0.0007 | 0.0000 | 0.0174 | 0.0029 | 0.0000 |
| Funds | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 |
| Observations | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 |

Table F2.G. Results for the UK equity funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | 0.1835 | 0.1513 | 0.1503 | 0.0778 | 0.3493 | 0.4843 | -0.0518 | 0.2201 | 0.4501 |
| | (0.461) | (0.233) | (0.222) | (0.705) | (0.457) | (0.328) | (0.817) | (0.605) | (0.316) |
| $f(age_{i,t})$ | 0.0151 | 0.0027 | -0.0203 | 0.0688 | 0.0746 | -0.0071 | 0.1307* | 0.1211 | 0.0553 |
| | (0.910) | (0.948) | (0.643) | (0.242) | (0.280) | (0.940) | (0.062) | (0.168) | (0.638) |
| $Bear_{i,t}$ | | -0.7346*** | -0.7425*** | | 0.1301* | 0.0143 | | 0.1476 | 0.0226 |
| | | (0.000) | (0.000) | | (0.085) | (0.880) | | (0.290) | (0.904) |
| $Bull_{i,t}$ | | -0.0247 | -0.0165 | | 0.0283 | -0.0529 | | -0.1674 | -0.2665 |
| | | (0.780) | (0.850) | | (0.781) | (0.771) | | (0.133) | (0.139) |
| $Size_{i,t-1}$ | -0.0003 | -0.0103 | 0.0013 | -0.0458*** | -0.0463*** | -0.0664 | -0.0057 | -0.0195 | -0.1134* |
| | (0.992) | (0.440) | (0.956) | (0.000) | (0.003) | (0.141) | (0.703) | (0.336) | (0.064) |
| $Share_{i,t-1}$ | 0.0204*** | 0.0085* | 0.0077 | 0.0124** | 0.0146** | 0.0148** | -0.0040 | 0.0038 | 0.0081 |
| | (0.005) | (0.076) | (0.115) | (0.050) | (0.033) | (0.043) | (0.556) | (0.577) | (0.245) |
| $ABIshare_{i,t-1}$ | -0.0222 | -0.0151** | -0.0143** | 0.0075 | 0.0023 | 0.0040 | 0.0100 | 0.0067 | 0.0061 |
| | (0.118) | (0.017) | (0.024) | (0.468) | (0.810) | (0.670) | (0.264) | (0.308) | (0.369) |
| $p0\_5_{i,t}$ | 0.0825 | 0.1195 | 0.0737 | 0.3336 | 0.2083 | -0.2192 | 0.4339 | 0.3065 | 0.2792 |
| | (0.794) | (0.427) | (0.583) | (0.253) | (0.409) | (0.489) | (0.129) | (0.213) | (0.328) |
| $p5\_10_{i,t}$ | -0.1222 | 0.0452 | 0.0863 | -0.0976 | -0.1737 | -0.1344 | 0.1348 | -0.0228 | 0.4274 |
| | (0.645) | (0.696) | (0.611) | (0.654) | (0.341) | (0.630) | (0.511) | (0.908) | (0.209) |
| $p10\_15_{i,t}$ | -0.0896 | 0.0309 | -0.1771 | -0.1254 | -0.1359 | -0.6448*** | -0.0452 | -0.1050 | -0.5232** |
| | (0.648) | (0.737) | (0.116) | (0.226) | (0.385) | (0.001) | (0.748) | (0.542) | (0.034) |
| $p15\_20_{i,t}$ | -0.0647 | 0.0706 | -0.0673 | -0.0315 | -0.0309 | -0.0937 | 0.0792 | 0.0077 | -0.0202 |
| | (0.620) | (0.226) | (0.348) | (0.617) | (0.630) | (0.437) | (0.260) | (0.910) | (0.870) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | 0.0435 | | | 0.3272 | | | 0.0003 |
| | | | (0.527) | | | (0.207) | | | (0.999) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | -0.0184 | | | -0.0293 | | | -0.2813 |
| | | | (0.808) | | | (0.872) | | | (0.190) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | 0.1175*** | | | 0.2732*** | | | 0.2436** |
| | | | (0.001) | | | (0.002) | | | (0.014) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | 0.0719** | | | 0.0253 | | | 0.0150 |
| | | | (0.024) | | | (0.740) | | | (0.855) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | -0.0027 | | | 0.0093 | | | 0.0347* |
| | | | (0.635) | | | (0.543) | | | (0.082) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | 0.0039 | | | 0.0656 | | | 0.0669 |
| | | | (0.901) | | | (0.131) | | | (0.228) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | -0.0056 | | | 0.0453 | | | 0.0544 |
| | | | (0.892) | | | (0.490) | | | (0.319) |
| $PPP_t$ | | 0.0789 | 0.0841 | | -0.3068 | -0.3000 | | -0.1977 | -0.1885 |
| | | (0.402) | (0.380) | | (0.432) | (0.437) | | (0.588) | (0.603) |
| $STK_t$ | | 0.2122** | 0.2179** | | 0.0365 | 0.0363 | | 0.0367 | 0.0199 |
| | | (0.025) | (0.021) | | (0.841) | (0.849) | | (0.836) | (0.913) |
| $R^2$ within | 0.0217 | 0.6377 | 0.6396 | 0.0113 | 0.0183 | 0.0215 | 0.0095 | 0.0457 | 0.0517 |
| F-statistic | 3.5466 | 80.5344 | 169.0617 | 13.6207 | 21.9433 | 38.9441 | 2.7024 | 15.0044 | 28.7790 |
| p-value | 0.0059 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0244 | 0.0000 | 0.0000 |
| Funds | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 |
| Observations | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 |

Table F3.A. Results for the all-funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0966** | **0.0508** | **0.0025** | **-0.1085** | **-0.0289** | **-0.0646** | **-0.2503** | **0.0501** | **0.0423** |
| | (0.724) | (0.603) | (0.981) | (0.453) | (0.929) | (0.855) | (0.246) | (0.853) | (0.891) |
| $f(age_{i,t})$ | **0.0188** | **0.0684** | **0.0703** | **0.0438** | **0.0884** | **0.0414** | **0.1046** | **0.1248** | **0.0906** |
| | (0.891) | (0.357) | (0.477) | (0.429) | (0.192) | (0.655) | (0.118) | (0.135) | (0.449) |
| $Bear_{i,t}$ | | **-0.5291***** | **-0.5934***** | | **0.0487** | **-0.1103** | | **-0.0440** | **-0.1973** |
| | | (0.000) | (0.000) | | (0.250) | (0.191) | | (0.436) | (0.124) |
| $Bull_{i,t}$ | | **0.0685** | **0.1492*** | | **0.0573** | **0.1404** | | **-0.1446**** | **-0.1184** |
| | | (0.339) | (0.071) | | (0.355) | (0.243) | | (0.022) | (0.371) |
| $Size_{i,t-1}$ | **0.0109** | **0.0143** | **0.0560**** | **0.0116** | **0.0175** | **0.1327***** | **0.0392*** | **0.0309** | **0.0972**** |
| | (0.674) | (0.309) | (0.033) | (0.459) | (0.323) | (0.008) | (0.084) | (0.150) | (0.024) |
| $Share_{i,t-1}$ | **0.0064**** | **0.0007** | **-0.0004** | **0.0074**** | **0.0063**** | **0.0032** | **0.0005** | **0.0009** | **-0.0010** |
| | (0.024) | (0.760) | (0.856) | (0.019) | (0.031) | (0.277) | (0.894) | (0.797) | (0.771) |
| $ABIshare_{i,t-1}$ | **0.0012** | **0.0004** | **0.0001** | **0.0138***** | **0.0127***** | **0.0113***** | **0.0150**** | **0.0144*** | **0.0135*** |
| | (0.703) | (0.894) | (0.981) | (0.002) | (0.003) | (0.005) | (0.044) | (0.057) | (0.073) |
| $p0\_5_{i,t}$ | **0.1107** | **0.0599** | **-0.2401** | **0.1775** | **0.0975** | **-0.5675** | **0.3182** | **0.1488** | **-0.1165** |
| | (0.643) | (0.563) | (0.179) | (0.349) | (0.559) | (0.199) | (0.103) | (0.421) | (0.758) |
| $p5\_10_{i,t}$ | **0.0121** | **0.0672** | **0.0207** | **-0.1137** | **-0.1753** | **-0.8060**** | **0.1027** | **-0.0677** | **-0.3352** |
| | (0.952) | (0.403) | (0.907) | (0.514) | (0.226) | (0.013) | (0.425) | (0.597) | (0.304) |
| $p10\_15_{i,t}$ | **0.0441** | **0.0601** | **-0.0449** | **0.0280** | **-0.0184** | **-0.4631**** | **0.1380** | **0.0384** | **-0.2279** |
| | (0.777) | (0.373) | (0.772) | (0.738) | (0.830) | (0.042) | (0.147) | (0.681) | (0.391) |
| $p15\_20_{i,t}$ | **0.0255** | **0.0583** | **0.0141** | **0.0482** | **0.0137** | **-0.0513** | **0.1381*** | **0.0516** | **0.0551** |
| | (0.820) | (0.231) | (0.889) | (0.480) | (0.849) | (0.737) | (0.087) | (0.380) | (0.590) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.2163**** | | | **0.4897*** | | | **0.1920** |
| | | | (0.048) | | | (0.083) | | | (0.305) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0259** | | | **0.3890**** | | | **0.1619** |
| | | | (0.805) | | | (0.013) | | | (0.339) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0509** | | | **0.2186**** | | | **0.1315** |
| | | | (0.443) | | | (0.023) | | | (0.277) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.0187** | | | **0.0177** | | | **-0.0120** |
| | | | (0.676) | | | (0.776) | | | (0.788) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0165*** | | | **-0.0455**** | | | **-0.0265**** |
| | | | (0.099) | | | (0.010) | | | (0.042) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0411** | | | **0.0993**** | | | **0.0930** |
| | | | (0.303) | | | (0.030) | | | (0.129) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0433** | | | **-0.0444** | | | **-0.0134** |
| | | | (0.288) | | | (0.342) | | | (0.822) |
| $PPP_t$ | | **-0.0739** | **-0.0784** | | **-0.0786** | **-0.0973** | | **-0.1252** | **-0.1308** |
| | | (0.341) | (0.311) | | (0.781) | (0.726) | | (0.529) | (0.506) |
| $STK_t$ | | **-0.0489** | **-0.0385** | | **-0.1346** | **-0.0942** | | **-0.1033** | **-0.0825** |
| | | (0.515) | (0.629) | | (0.167) | (0.361) | | (0.314) | (0.448) |
| $R^2$ within | 0.0064 | 0.3974 | 0.4008 | 0.0047 | 0.0067 | 0.0109 | 0.0149 | 0.0239 | 0.0259 |
| F-statistic | 1.9198 | 28.1731 | 140.4861 | 2.1225 | 1.5200 | 197.5986 | 1.0758 | 5.4419 | 33.3809 |
| p-value | 0.0966 | 0.0000 | 0.0000 | 0.0674 | 0.1753 | 0.0000 | 0.4076 | 0.0001 | 0.0000 |
| Funds | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 |
| Observations | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 |

Table F3.B. Results for the allocation funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0553** | **0.0281** | **-0.1621** | **0.1043** | **-0.7793*** ** | **-1.5775*** ** | **-0.2308** | **-0.5707** ** | **-0.8385* ** |
| | (0.862) | (0.841) | (0.289) | (0.708) | (0.009) | (0.000) | (0.494) | (0.017) | (0.099) |
| $f(age_{i,t})$ | **-0.0902** | **-0.0693** | **-0.0326** | **-0.0756** | **-0.0940** | **0.1869** | **0.1041** | **0.0678** | **0.2119** |
| | (0.600) | (0.490) | (0.802) | (0.497) | (0.433) | (0.429) | (0.416) | (0.682) | (0.530) |
| $Bear_{i,t}$ | | **-0.6506*** ** | **-0.5891*** ** | | **0.3552*** ** | **0.6779*** ** | | **-0.0526** | **-0.0252** |
| | | (0.000) | (0.000) | | (0.001) | (0.001) | | (0.666) | (0.949) |
| $Bull_{i,t}$ | | **-0.0341** | **-0.0031** | | **0.3055** | **0.4443** | | **-0.1006** | **-0.2567** |
| | | (0.770) | (0.982) | | (0.133) | (0.110) | | (0.509) | (0.511) |
| $Size_{i,t-1}$ | **0.0501** | **0.0381** | **0.1709*** ** | **0.0572** | **0.1009** | **0.3683*** ** | **0.0850** ** | **0.0700** | **0.0799** |
| | (0.260) | (0.109) | (0.000) | (0.118) | (0.117) | (0.000) | (0.030) | (0.111) | (0.304) |
| $Share_{i,t-1}$ | **0.0010** | **-0.0123** | **-0.0176* ** | **-0.0325** ** | **-0.0409** | **-0.0452* ** | **-0.0294* ** | **-0.0196** | **-0.0147** |
| | (0.937) | (0.211) | (0.081) | (0.019) | (0.120) | (0.098) | (0.097) | (0.260) | (0.389) |
| $ABIshare_{i,t-1}$ | **0.0110** | **0.0202** | **0.0189** | **0.0289** | **0.0408** | **0.0385** | **0.0225** | **0.0150** | **0.0122** |
| | (0.623) | (0.158) | (0.167) | (0.420) | (0.367) | (0.385) | (0.480) | (0.653) | (0.708) |
| $p0\_5_{i,t}$ | **0.0537** | **0.1394** | **0.6578** | **-0.1075** | **0.0021** | **2.0171** ** | **0.3623** | **0.4390* ** | **1.6457** ** |
| | (0.866) | (0.198) | (0.328) | (0.588) | (0.991) | (0.027) | (0.115) | (0.056) | (0.048) |
| $p5\_10_{i,t}$ | **-0.0643** | **0.1148** | **-0.0863** | **-0.4524* ** | **-0.3415** | **0.0942** | **0.0280** | **0.1284** | **0.6037** |
| | (0.809) | (0.361) | (0.714) | (0.087) | (0.127) | (0.870) | (0.868) | (0.439) | (0.376) |
| $p10\_15_{i,t}$ | **0.0193** | **0.1096** | **-0.1440** | **0.0586** | **0.1339** | **1.1026** | **0.3177* ** | **0.3408** ** | **1.5773* ** |
| | (0.894) | (0.148) | (0.620) | (0.788) | (0.470) | (0.170) | (0.067) | (0.033) | (0.090) |
| $p15\_20_{i,t}$ | **0.0518** | **0.0734** | **0.3120** | **-0.0168** | **0.1351** | **1.1507** ** | **0.2331** | **0.2394* ** | **1.4690*** ** |
| | (0.783) | (0.387) | (0.187) | (0.897) | (0.413) | (0.013) | (0.114) | (0.071) | (0.005) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **-0.3941** | | | **-1.6624** ** | | | **-1.1691** ** |
| | | | (0.369) | | | (0.011) | | | (0.015) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0972** | | | **-0.4639** | | | **-0.5412** |
| | | | (0.554) | | | (0.307) | | | (0.255) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0974** | | | **-0.6888** | | | **-0.8420** |
| | | | (0.577) | | | (0.129) | | | (0.125) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.1537** | | | **-0.6281*** ** | | | **-0.7389** ** |
| | | | (0.221) | | | (0.009) | | | (0.022) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0562*** ** | | | **-0.1214*** ** | | | **-0.0155** |
| | | | (0.000) | | | (0.000) | | | (0.722) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **-0.0356** | | | **-0.1939* ** | | | **-0.0233** |
| | | | (0.278) | | | (0.082) | | | (0.906) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0193** | | | **-0.0815** | | | **0.0905** |
| | | | (0.671) | | | (0.518) | | | (0.650) |
| $PPP_t$ | | **-0.0020** | **-0.0098** | | **0.5341** | **0.6251* ** | | **0.3901** | **0.5280* ** |
| | | (0.991) | (0.948) | | (0.150) | (0.062) | | (0.182) | (0.058) |
| $STK_t$ | | **0.1147** | **0.1390** | | **-0.0893** | **-0.0494** | | **0.1364** | **0.1239** |
| | | (0.341) | (0.234) | | (0.709) | (0.832) | | (0.564) | (0.590) |
| $R^2$ within | 0.0246 | 0.5048 | 0.5131 | 0.0184 | 0.0492 | 0.0633 | 0.0433 | 0.0466 | 0.0579 |
| F-statistic | 1.4676 | 42.9000 | 93.7324 | 2.7271 | 25.4584 | 84.0973 | 2.1000 | 5.6234 | 107.8780 |
| p-value | 0.2229 | 0.0000 | 0.0000 | 0.0284 | 0.0000 | 0.0000 | 0.0784 | 0.0002 | 0.0000 |
| Funds | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 | 320 |
| Observations | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 |

Table F3.C. Results for the fixed income funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0177** | **-0.0402** | **-0.1624** | **0.2597** | **0.3634** | **-0.0005** | **0.3670** | **0.4301*** | **0.1586** |
| | (0.952) | (0.850) | (0.481) | (0.500) | (0.402) | (0.999) | (0.216) | (0.091) | (0.627) |
| $f(age_{i,t})$ | **-0.0856** | **0.0355** | **0.0533** | **-0.2450*** | **-0.2574*** | **-0.1808** | **-0.2288**** | **-0.2808**** | **-0.2303*** |
| | (0.447) | (0.842) | (0.794) | (0.065) | (0.073) | (0.235) | (0.040) | (0.021) | (0.071) |
| $Bear_{i,t}$ | | **-0.2572**** | **-0.4876**** | | **0.1027** | **-0.1664** | | **0.1959***** | **0.1888** |
| | | (0.031) | (0.017) | | (0.371) | (0.542) | | (0.002) | (0.329) |
| $Bull_{i,t}$ | | **0.1298** | **0.1828** | | **-0.0397** | **0.2452** | | **-0.0871*** | **0.1531** |
| | | (0.251) | (0.182) | | (0.509) | (0.148) | | (0.057) | (0.199) |
| $Size_{i,t-1}$ | **0.0366*** | **0.0539***** | **0.1660***** | **0.0805**** | **0.0756**** | **0.4000**** | **0.0643**** | **0.0554*** | **0.3404***** |
| | (0.058) | (0.006) | (0.002) | (0.029) | (0.034) | (0.042) | (0.032) | (0.059) | (0.008) |
| $Share_{i,t-1}$ | **0.0045*** | **0.0031** | **0.0009** | **0.0024** | **0.0022** | **-0.0036** | **-0.0002** | **-0.0001** | **-0.0050** |
| | (0.051) | (0.212) | (0.758) | (0.722) | (0.741) | (0.503) | (0.969) | (0.981) | (0.247) |
| $ABIshare_{i,t-1}$ | **0.0047** | **-0.0072** | **-0.0104** | **0.0343** | **0.0309** | **0.0171** | **0.0213** | **0.0199** | **0.0048** |
| | (0.788) | (0.476) | (0.297) | (0.185) | (0.173) | (0.398) | (0.206) | (0.223) | (0.710) |
| $p0\_5_{i,t}$ | **-0.2353** | **-0.0872** | **-0.4726** | **-0.0561** | **-0.1358** | **-0.4726** | **-0.1077** | **-0.2075** | **-1.0236** |
| | (0.177) | (0.617) | (0.210) | (0.710) | (0.399) | (0.547) | (0.382) | (0.151) | (0.204) |
| $p5\_10_{i,t}$ | **-0.1261** | **-0.0112** | **0.2199** | **-0.1896** | **-0.2605** | **-0.3221** | **-0.1627** | **-0.2501**** | **-0.6675*** |
| | (0.387) | (0.934) | (0.488) | (0.581) | (0.280) | (0.421) | (0.154) | (0.023) | (0.062) |
| $p10\_15_{i,t}$ | **-0.0772** | **-0.0252** | **0.0289** | **0.0355** | **-0.0138** | **-0.2591** | **0.0352** | **-0.0323** | **-0.3313** |
| | (0.407) | (0.791) | (0.896) | (0.703) | (0.898) | (0.521) | (0.691) | (0.753) | (0.237) |
| $p15\_20_{i,t}$ | **-0.0252** | **0.0255** | **0.0150** | **0.0712** | **0.0240** | **0.0550** | **0.0801** | **0.0031** | **0.0260** |
| | (0.798) | (0.768) | (0.952) | (0.470) | (0.645) | (0.763) | (0.302) | (0.951) | (0.871) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.2862** | | | **0.2828** | | | **0.6145** |
| | | | (0.153) | | | (0.565) | | | (0.225) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **-0.1378** | | | **0.0375** | | | **0.2436** |
| | | | (0.395) | | | (0.870) | | | (0.229) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **-0.0372** | | | **0.0984** | | | **0.1259** |
| | | | (0.702) | | | (0.550) | | | (0.298) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.0022** | | | **-0.0412** | | | **-0.0352** |
| | | | (0.983) | | | (0.635) | | | (0.640) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0468***** | | | **-0.1339**** | | | **-0.1164***** |
| | | | (0.008) | | | (0.049) | | | (0.007) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.1321*** | | | **0.1583** | | | **0.0099** |
| | | | (0.074) | | | (0.205) | | | (0.909) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0248** | | | **-0.1459**** | | | **-0.1252**** |
| | | | (0.612) | | | (0.033) | | | (0.018) |
| $PPP_t$ | | **-0.0878** | **-0.0867** | | **0.0021** | **-0.0260** | | **0.1226** | **0.0804** |
| | | (0.531) | (0.543) | | (0.995) | (0.937) | | (0.404) | (0.563) |
| $STK_t$ | | **-0.1710** | **-0.1473** | | **-0.0513** | **0.0187** | | **-0.0424** | **0.0244** |
| | | (0.331) | (0.410) | | (0.659) | (0.828) | | (0.685) | (0.780) |
| $R^2$ within | 0.0137 | 0.1127 | 0.1241 | 0.0160 | 0.0189 | 0.0321 | 0.0150 | 0.0314 | 0.0453 |
| F-statistic | 5.3400 | 7.9423 | 15.8912 | 7.6475 | 9.2861 | 20.2366 | 15.0926 | 10.5889 | 16.5984 |
| p-value | 0.0004 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 |
| Observations | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 |

Table F3.D. Results for the equity funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.0609** | **0.1162** | **0.1481** | **-0.2233** | **-0.1899** | **-0.0519** | **-0.4003*** | **-0.0609** | **0.0232** |
| | (0.837) | (0.260) | (0.193) | (0.124) | (0.585) | (0.887) | (0.054) | (0.855) | (0.950) |
| $f(age_{i,t})$ | **0.0248** | **0.0415** | **0.0031** | **0.0935** | **0.1347**** | **0.0346** | **0.1689**** | **0.1857**** | **0.1388** |
| | (0.868) | (0.477) | (0.967) | (0.110) | (0.035) | (0.685) | (0.029) | (0.036) | (0.277) |
| $Bear_{i,t}$ | | **-0.5782***** | **-0.6698***** | | **-0.0127** | **-0.2276** | | **-0.0898** | **-0.2558** |
| | | (0.000) | (0.000) | | (0.852) | (0.109) | | (0.181) | (0.110) |
| $Bull_{i,t}$ | | **0.0524** | **0.0427** | | **0.0379** | **0.0382** | | **-0.1974***** | **-0.1751** |
| | | (0.488) | (0.611) | | (0.528) | (0.762) | | (0.005) | (0.284) |
| $Size_{i,t-1}$ | **0.0076** | **0.0074** | **0.0347** | **-0.0005** | **0.0051** | **0.0544** | **0.0393*** | **0.0266** | **0.0335** |
| | (0.760) | (0.429) | (0.129) | (0.968) | (0.672) | (0.213) | (0.053) | (0.119) | (0.465) |
| $Share_{i,t-1}$ | **0.0111**** | **0.0025** | **0.0013** | **0.0106**** | **0.0087**** | **0.0060** | **-0.0039** | **-0.0023** | **-0.0031** |
| | (0.030) | (0.426) | (0.662) | (0.025) | (0.046) | (0.177) | (0.477) | (0.641) | (0.511) |
| $ABIshare_{i,t-1}$ | **-0.0028** | **-0.0028** | **-0.0027** | **0.0181**** | **0.0184**** | **0.0179**** | **0.0209***** | **0.0225***** | **0.0221***** |
| | (0.589) | (0.503) | (0.513) | (0.017) | (0.021) | (0.017) | (0.003) | (0.004) | (0.004) |
| $p0\_5_{i,t}$ | **0.1492** | **0.0580** | **-0.1895** | **0.2017** | **0.1322** | **-0.6446** | **0.4257*** | **0.2428** | **0.0950** |
| | (0.570) | (0.532) | (0.223) | (0.361) | (0.527) | (0.138) | (0.059) | (0.220) | (0.808) |
| $p5\_10_{i,t}$ | **-0.0106** | **0.0332** | **-0.0708** | **-0.1285** | **-0.1835** | **-0.9437**** | **0.1605** | **-0.0282** | **-0.2390** |
| | (0.961) | (0.637) | (0.618) | (0.417) | (0.231) | (0.015) | (0.256) | (0.830) | (0.528) |
| $p10\_15_{i,t}$ | **0.0206** | **0.0295** | **-0.1225** | **-0.0235** | **-0.0785** | **-0.5923**** | **0.1342** | **0.0275** | **-0.2823** |
| | (0.909) | (0.684) | (0.419) | (0.824) | (0.494) | (0.030) | (0.218) | (0.799) | (0.375) |
| $p15\_20_{i,t}$ | **-0.0026** | **0.0297** | **-0.0413** | **0.0328** | **-0.0086** | **-0.1066** | **0.1698**** | **0.0644** | **0.0225** |
| | (0.982) | (0.479) | (0.555) | (0.665) | (0.922) | (0.478) | (0.033) | (0.270) | (0.852) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.1792*** | | | **0.5762**** | | | **0.1087** |
| | | | (0.055) | | | (0.048) | | | (0.628) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.0624** | | | **0.4825**** | | | **0.1369** |
| | | | (0.473) | | | (0.018) | | | (0.501) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0791** | | | **0.2663**** | | | **0.1684** |
| | | | (0.208) | | | (0.020) | | | (0.254) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.0339** | | | **0.0403** | | | **0.0183** |
| | | | (0.267) | | | (0.561) | | | (0.772) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0102** | | | **-0.0179** | | | **-0.0020** |
| | | | (0.212) | | | (0.315) | | | (0.910) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0550*** | | | **0.1295*** | | | **0.0987** |
| | | | (0.085) | | | (0.051) | | | (0.202) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **0.0061** | | | **0.0009** | | | **-0.0120** |
| | | | (0.840) | | | (0.988) | | | (0.880) |
| $PPP_t$ | | **-0.0353** | **-0.0371** | | **0.0054** | **-0.0246** | | **-0.1316** | **-0.1429** |
| | | (0.652) | (0.632) | | (0.985) | (0.932) | | (0.625) | (0.593) |
| $STK_t$ | | **0.0019** | **0.0118** | | **-0.1485** | **-0.1213** | | **-0.1014** | **-0.0953** |
| | | (0.977) | (0.865) | | (0.149) | (0.269) | | (0.343) | (0.402) |
| $R^2$ within | 0.0098 | 0.5416 | 0.5438 | 0.0071 | 0.0098 | 0.0140 | 0.0247 | 0.0409 | 0.0427 |
| F-statistic | 1.4524 | 34.4862 | 184.4151 | 1.9979 | 1.6484 | 21.3407 | 2.3349 | 20.3399 | 21.0985 |
| p-value | 0.2191 | 0.0000 | 0.0000 | 0.0841 | 0.1344 | 0.0000 | 0.0463 | 0.0000 | 0.0000 |
| Funds | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 |
| Observations | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 |

Table F3.E. Results for the emerging equity funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.6202** | **-0.4492**** | **-0.3854*** | **-0.7275*** | **-0.5964** | **-1.2181**** | **-1.3945**** | **-0.5974** | **-1.0065**** |
| | (0.149) | (0.046) | (0.059) | (0.075) | (0.120) | (0.022) | (0.015) | (0.111) | (0.014) |
| $f(age_{i,t})$ | **0.1464** | **0.3463***** | **0.3653**** | **0.2705** | **0.5353** | **0.5363** | **0.4275** | **0.6529*** | **0.5592** |
| | (0.568) | (0.005) | (0.022) | (0.159) | (0.115) | (0.214) | (0.128) | (0.068) | (0.201) |
| $Bear_{i,t}$ | | **-0.7948***** | **-0.9226***** | | **-0.0524** | **-0.3848** | | **-0.4371***** | **-0.7192**** |
| | | (0.000) | (0.000) | | (0.463) | (0.193) | | (0.000) | (0.029) |
| $Bull_{i,t}$ | | **0.0662** | **0.2344**** | | **0.3090** | **0.7191** | | **-0.1526** | **0.1144** |
| | | (0.313) | (0.036) | | (0.117) | (0.120) | | (0.476) | (0.790) |
| $Size_{i,t-1}$ | **0.0841**** | **0.0248**** | **-0.0526** | **0.0543**** | **0.0507**** | **0.4959***** | **0.1569***** | **0.1266***** | **0.4934***** |
| | (0.045) | (0.042) | (0.342) | (0.021) | (0.045) | (0.000) | (0.001) | (0.003) | (0.000) |
| $Share_{i,t-1}$ | **0.0157***** | **0.0008** | **0.0030** | **0.0061** | **-0.0004** | **-0.0169*** | **0.0107** | **0.0038** | **-0.0107** |
| | (0.008) | (0.741) | (0.376) | (0.279) | (0.947) | (0.059) | (0.157) | (0.590) | (0.266) |
| $ABIshare_{i,t-1}$ | **-0.0058** | **0.0253**** | **0.0267**** | **0.0328** | **0.0373** | **0.0350** | **0.0438** | **0.0349** | **0.0382** |
| | (0.595) | (0.035) | (0.037) | (0.319) | (0.281) | (0.151) | (0.193) | (0.182) | (0.111) |
| $p0\_5_{i,t}$ | **0.2209** | **0.7513***** | **0.4293** | **0.3501** | **0.3900** | **1.4924**** | **0.5360** | **0.5304** | **1.2558**** |
| | (0.538) | (0.000) | (0.124) | (0.605) | (0.536) | (0.013) | (0.534) | (0.411) | (0.040) |
| $p5\_10_{i,t}$ | **-0.2779** | **0.5905***** | **-1.1666*** | **-0.3970** | **-0.1276** | **-2.8207** | **0.1119** | **0.1384** | **-3.4175** |
| | (0.531) | (0.002) | (0.087) | (0.501) | (0.828) | (0.233) | (0.884) | (0.829) | (0.286) |
| $p10\_15_{i,t}$ | **-0.3639** | **0.3647*** | **0.3463** | **-0.4710** | **-0.4180** | **-0.3533** | **-0.4480** | **-0.5330** | **-1.3000**** |
| | (0.342) | (0.073) | (0.183) | (0.295) | (0.353) | (0.674) | (0.395) | (0.156) | (0.019) |
| $p15\_20_{i,t}$ | **-0.1573** | **0.1531** | **0.1525** | **-0.3650** | **-0.4458**** | **-0.4678** | **-0.2037** | **-0.5245**** | **-0.7231** |
| | (0.439) | (0.484) | (0.704) | (0.101) | (0.031) | (0.442) | (0.609) | (0.014) | (0.317) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.2986** | | | **-0.7168***** | | | **-0.2400** |
| | | | (0.232) | | | (0.007) | | | (0.255) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **1.3615**** | | | **2.4670** | | | **3.1497** |
| | | | (0.015) | | | (0.137) | | | (0.176) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **-0.0213** | | | **0.1933** | | | **0.6860**** |
| | | | (0.817) | | | (0.693) | | | (0.013) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.0069** | | | **0.0537** | | | **0.1427** |
| | | | (0.965) | | | (0.891) | | | (0.756) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **0.0338** | | | **-0.1932***** | | | **-0.1577***** |
| | | | (0.173) | | | (0.002) | | | (0.005) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0861** | | | **0.2776** | | | **0.2266** |
| | | | (0.454) | | | (0.125) | | | (0.299) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.1059** | | | **-0.2392** | | | **-0.1588** |
| | | | (0.204) | | | (0.221) | | | (0.402) |
| $PPP_t$ | | | | | | | | | |
| $STK_t$ | | **0.0503** | **0.0517** | | **-0.6013** | **-0.5208** | | **-0.7002** | **-0.6007** |
| | | (0.763) | (0.773) | | (0.161) | (0.143) | | (0.158) | (0.184) |
| $R^2$ within | 0.1275 | 0.7960 | 0.8069 | 0.0540 | 0.0909 | 0.1421 | 0.2205 | 0.2925 | 0.3311 |
| F-statistic | 17.6804 | 377.4719 | 6521.2353 | 28.3139 | 317.6604 | 1699.4745 | 5.5521 | 39.8424 | 7245.6789 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0008 | 0.0000 | 0.0000 |
| Funds | 183 | 183 | 183 | 183 | 183 | 183 | 183 | 183 | 183 |
| Observations | 713 | 713 | 713 | 713 | 713 | 713 | 713 | 713 | 713 |

Table F3.F. Results for the international equity funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **-0.2374** | **0.0467** | **0.0625** | **-0.5385**** | **-0.5800*** | **-0.4046** | **-0.5895**** | **-0.0793** | **-0.0091** |
| | (0.382) | (0.656) | (0.649) | (0.015) | (0.088) | (0.233) | (0.015) | (0.800) | (0.976) |
| $f(age_{i,t})$ | **0.0415** | **0.0809** | **0.0658** | **0.1115** | **0.1540*** | **0.0830** | **0.1498** | **0.1854*** | **0.1774** |
| | (0.717) | (0.174) | (0.443) | (0.244) | (0.079) | (0.461) | (0.110) | (0.053) | (0.173) |
| $Bear_{i,t}$ | | **-0.4428***** | **-0.5081***** | | **-0.1116** | **-0.3792*** | | **-0.2519**** | **-0.4381**** |
| | | (0.000) | (0.000) | | (0.435) | (0.092) | | (0.024) | (0.011) |
| $Bull_{i,t}$ | | **0.1181*** | **0.1308** | | **0.0304** | **0.0686** | | **-0.2267***** | **-0.1223** |
| | | (0.078) | (0.131) | | (0.711) | (0.448) | | (0.009) | (0.338) |
| $Size_{i,t-1}$ | **0.0094** | **0.0175*** | **0.0506** | **0.0212** | **0.0325**** | **0.1062** | **0.0653**** | **0.0509***** | **0.0907*** |
| | (0.654) | (0.070) | (0.192) | (0.308) | (0.023) | (0.121) | (0.016) | (0.002) | (0.062) |
| $Share_{i,t-1}$ | **0.0088** | **-0.0017** | **-0.0042** | **0.0299*** | **0.0233*** | **0.0162** | **-0.0007** | **0.0011** | **-0.0029** |
| | (0.323) | (0.736) | (0.424) | (0.050) | (0.075) | (0.274) | (0.963) | (0.929) | (0.820) |
| $ABIshare_{i,t-1}$ | **0.0165*** | **0.0056** | **0.0051** | **0.0326***** | **0.0255**** | **0.0216**** | **0.0365***** | **0.0264**** | **0.0236**** |
| | (0.061) | (0.192) | (0.250) | (0.005) | (0.032) | (0.042) | (0.005) | (0.026) | (0.025) |
| $p0\_5_{i,t}$ | **0.1269** | **0.0273** | **-0.2576** | **0.0106** | **-0.0453** | **-0.7039** | **0.3049** | **0.1191** | **-0.0594** |
| | (0.550) | (0.755) | (0.331) | (0.970) | (0.881) | (0.299) | (0.230) | (0.634) | (0.936) |
| $p5\_10_{i,t}$ | **0.0219** | **0.0314** | **-0.1454** | **-0.1670** | **-0.2305** | **-1.2470**** | **0.1042** | **-0.0895** | **-0.8251*** |
| | (0.894) | (0.643) | (0.407) | (0.422) | (0.311) | (0.016) | (0.490) | (0.575) | (0.060) |
| $p10\_15_{i,t}$ | **0.0544** | **0.0261** | **-0.0210** | **0.0313** | **-0.0521** | **-0.2241** | **0.2039** | **0.0785** | **0.1402** |
| | (0.726) | (0.720) | (0.918) | (0.846) | (0.761) | (0.563) | (0.112) | (0.516) | (0.741) |
| $p15\_20_{i,t}$ | **0.0210** | **0.0126** | **0.0291** | **0.0674** | **-0.0086** | **-0.0030** | **0.2142*** | **0.0774** | **0.1319** |
| | (0.832) | (0.765) | (0.764) | (0.604) | (0.950) | (0.989) | (0.066) | (0.377) | (0.508) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.2056** | | | **0.4908** | | | **0.1355** |
| | | | (0.201) | | | (0.235) | | | (0.763) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **0.1069** | | | **0.6490**** | | | **0.4765**** |
| | | | (0.305) | | | (0.025) | | | (0.046) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.0161** | | | **0.0648** | | | **-0.0546** |
| | | | (0.863) | | | (0.718) | | | (0.785) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **-0.0136** | | | **-0.0165** | | | **-0.0359** |
| | | | (0.762) | | | (0.881) | | | (0.685) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0129** | | | **-0.0283** | | | **-0.0160** |
| | | | (0.353) | | | (0.273) | | | (0.399) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0395** | | | **0.1584*** | | | **0.1112** |
| | | | (0.248) | | | (0.074) | | | (0.210) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0058** | | | **-0.0192** | | | **-0.0558** |
| | | | (0.865) | | | (0.763) | | | (0.515) |
| $PPP_t$ | | **-0.0983** | **-0.1131** | | **0.2512** | **0.1692** | | **-0.1286** | **-0.1920** |
| | | (0.293) | (0.215) | | (0.362) | (0.516) | | (0.617) | (0.429) |
| $STK_t$ | | **-0.1069** | **-0.0992** | | **-0.2523*** | **-0.2283*** | | **-0.1808**** | **-0.1700*** |
| | | (0.169) | (0.220) | | (0.051) | (0.087) | | (0.047) | (0.068) |
| $R^2$ within | 0.0144 | 0.4816 | 0.4838 | 0.0198 | 0.0334 | 0.0395 | 0.0416 | 0.0711 | 0.0760 |
| F-statistic | 5.5199 | 30.3687 | 104.8222 | 3.0363 | 4.3208 | 57.8209 | 2.9754 | 3.4857 | 26.9250 |
| p-value | 0.0003 | 0.0000 | 0.0000 | 0.0137 | 0.0007 | 0.0000 | 0.0152 | 0.0032 | 0.0000 |
| Funds | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 |
| Observations | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 |

Table F3.G. Results for the UK equity funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | Sharpe | | | $R_{Fund}$-$R_{PPB}$ | | | M2 | |
|---|---|---|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (4) | (2) | (3) | (4) | (2) | (3) | (4) |
| ***Constant*** | **0.1768** | **0.1650** | **0.1678** | **0.0027** | **0.2816** | **0.4780** | **-0.1808** | **0.1132** | **0.3742** |
| | (0.615) | (0.238) | (0.207) | (0.991) | (0.558) | (0.349) | (0.498) | (0.797) | (0.427) |
| $f(age_{i,t})$ | **0.0184** | **-0.0130** | **-0.0491** | **0.1190** | **0.1297** | **0.0302** | **0.2154**** | **0.2074** | **0.1337** |
| | (0.928) | (0.842) | (0.460) | (0.176) | (0.243) | (0.833) | (0.047) | (0.137) | (0.447) |
| $Bear_{i,t}$ | | **-0.7351***** | **-0.7478***** | | **0.1309*** | **-0.0132** | | **0.1489** | **-0.0117** |
| | | (0.000) | (0.000) | | (0.081) | (0.905) | | (0.284) | (0.954) |
| $Bull_{i,t}$ | | **-0.0252** | **-0.0146** | | **0.0287** | **-0.0585** | | **-0.1670** | **-0.2923** |
| | | (0.777) | (0.878) | | (0.779) | (0.781) | | (0.136) | (0.143) |
| $Size_{i,t-1}$ | **0.0001** | **-0.0083** | **0.0153** | **-0.0483***** | **-0.0487***** | **-0.0967*** | **-0.0091** | **-0.0230** | **-0.1405**** |
| | (0.998) | (0.514) | (0.602) | (0.000) | (0.003) | (0.086) | (0.570) | (0.273) | (0.044) |
| $Share_{i,t-1}$ | **0.0204***** | **0.0084*** | **0.0072** | **0.0127**** | **0.0148**** | **0.0158**** | **-0.0035** | **0.0041** | **0.0084** |
| | (0.004) | (0.074) | (0.129) | (0.046) | (0.032) | (0.037) | (0.611) | (0.545) | (0.248) |
| $ABIshare_{i,t-1}$ | **-0.0222** | **-0.0150**** | **-0.0140**** | **0.0070** | **0.0021** | **0.0037** | **0.0093** | **0.0063** | **0.0058** |
| | (0.113) | (0.018) | (0.024) | (0.493) | (0.827) | (0.696) | (0.291) | (0.331) | (0.393) |
| $p0\_5_{i,t}$ | **0.0799** | **0.1009** | **0.0027** | **0.3724** | **0.2373** | **-0.4654** | **0.4921*** | **0.3501** | **0.3725** |
| | (0.813) | (0.502) | (0.986) | (0.195) | (0.342) | (0.339) | (0.081) | (0.153) | (0.374) |
| $p5\_10_{i,t}$ | **-0.1235** | **0.0324** | **0.0661** | **-0.0681** | **-0.1515** | **-0.0702** | **0.1800** | **0.0108** | **0.6996** |
| | (0.662) | (0.779) | (0.760) | (0.747) | (0.383) | (0.863) | (0.376) | (0.955) | (0.157) |
| $p10\_15_{i,t}$ | **-0.0899** | **0.0233** | **-0.2893**** | **-0.1055** | **-0.1205** | **-0.8066***** | **-0.0140** | **-0.0815** | **-0.6678**** |
| | (0.671) | (0.801) | (0.024) | (0.306) | (0.423) | (0.001) | (0.921) | (0.631) | (0.025) |
| $p15\_20_{i,t}$ | **-0.0650** | **0.0661** | **-0.1211** | **-0.0204** | **-0.0231** | **-0.0913** | **0.0965** | **0.0196** | **-0.0156** |
| | (0.626) | (0.257) | (0.162) | (0.746) | (0.709) | (0.589) | (0.162) | (0.768) | (0.928) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | **0.0777** | | | **0.5084** | | | **-0.0241** |
| | | | (0.481) | | | (0.204) | | | (0.941) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | **-0.0166** | | | **-0.0532** | | | **-0.4255** |
| | | | (0.884) | | | (0.846) | | | (0.186) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | **0.1782***** | | | **0.3882***** | | | **0.3547**** |
| | | | (0.001) | | | (0.002) | | | (0.011) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | **0.1005**** | | | **0.0318** | | | **0.0231** |
| | | | (0.024) | | | (0.763) | | | (0.836) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | **-0.0079** | | | **0.0217** | | | **0.0486**** |
| | | | (0.356) | | | (0.288) | | | (0.045) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | **0.0070** | | | **0.0833** | | | **0.0892** |
| | | | (0.866) | | | (0.149) | | | (0.203) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | **-0.0069** | | | **0.0497** | | | **0.0700** |
| | | | (0.896) | | | (0.554) | | | (0.306) |
| $PPP_t$ | | **0.0831** | **0.0908** | | **-0.3162** | **-0.3138** | | **-0.2121** | **-0.2106** |
| | | (0.384) | (0.353) | | (0.417) | (0.415) | | (0.561) | (0.559) |
| $STK_t$ | | **0.2151**** | **0.2259**** | | **0.0272** | **0.0203** | | **0.0221** | **-0.0059** |
| | | (0.025) | (0.018) | | (0.884) | (0.919) | | (0.903) | (0.975) |
| $R^2$ within | 0.0217 | 0.6377 | 0.6399 | 0.0115 | 0.0185 | 0.0217 | 0.0099 | 0.0462 | 0.0524 |
| F-statistic | 3.4711 | 71.3749 | 198.4291 | 13.4490 | 23.6947 | 33.3012 | 2.9421 | 14.8333 | 31.4113 |
| p-value | 0.0067 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0161 | 0.0000 | 0.0000 |
| Funds | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 |
| Observations | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 |

Table F4.A. Results for the all-funds sample with operational year dummies. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | $R_{Fund}$-$R_{PPB}$ | | M2 | |
|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (2) | (3) | (2) | (3) |
| ***Constant*** | **-0.0480** | **0.1190** | **0.0105** | **0.1233** | **-0.0404** | **0.2403** |
| | (0.680) | (0.295) | (0.889) | (0.710) | (0.710) | (0.342) |
| $\boldsymbol{Bear_{i,t}}$ | | **-0.5206***** | | **0.0621** | | **-0.0354** |
| | | (0.000) | | (0.153) | | (0.545) |
| $\boldsymbol{Bull_{i,t}}$ | | **0.0757** | | **0.0629** | | **-0.1401**** |
| | | (0.279) | | (0.311) | | (0.028) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0086** | **0.0193** | **0.0086** | **0.0182** | **0.0409*** | **0.0339** |
| | (0.749) | (0.272) | (0.597) | (0.349) | (0.077) | (0.136) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0051** | **-0.0003** | **0.0050** | **0.0039** | **-0.0009** | **-0.0002** |
| | (0.134) | (0.910) | (0.107) | (0.203) | (0.794) | (0.959) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0009** | **-0.0005** | **0.0093***** | **0.0089**** | **0.0129**** | **0.0133**** |
| | (0.809) | (0.864) | (0.009) | (0.016) | (0.040) | (0.044) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.0088** | **-0.0548** | **0.0670** | **-0.0251** | **0.1732** | **0.0433** |
| | (0.939) | (0.526) | (0.686) | (0.865) | (0.271) | (0.775) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.0504** | **-0.0048** | **-0.2013** | **-0.2645*** | **-0.0184** | **-0.1463** |
| | (0.646) | (0.941) | (0.242) | (0.062) | (0.868) | (0.229) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.0048** | **0.0104** | **-0.0433** | **-0.0868** | **0.0428** | **-0.0257** |
| | (0.952) | (0.841) | (0.522) | (0.273) | (0.519) | (0.739) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.0170** | **0.0249** | **0.0047** | **-0.0251** | **0.0821** | **0.0174** |
| | (0.830) | (0.481) | (0.929) | (0.690) | (0.163) | (0.734) |
| $\boldsymbol{PPP_t}$ | | **-0.0567** | | **-0.0635** | | **-0.1052** |
| | | (0.426) | | (0.824) | | (0.587) |
| $\boldsymbol{STK_t}$ | | **-0.0306** | | **-0.1099** | | **-0.0662** |
| | | (0.657) | | (0.261) | | (0.495) |
| $\boldsymbol{y1_{i,t}}$ | **-0.0538** | **-0.0443** | **-0.1387** | **-0.1648*** | **-0.1128** | **-0.1257** |
| | (0.521) | (0.413) | (0.110) | (0.092) | (0.156) | (0.134) |
| $\boldsymbol{y2_{i,t}}$ | **0.0302** | **-0.0008** | **0.0644** | **0.0426** | **-0.0308** | **-0.0470** |
| | (0.707) | (0.984) | (0.104) | (0.345) | (0.437) | (0.368) |
| $\boldsymbol{y3_{i,t}}$ | **0.0530** | **0.0617** | **0.0593** | **0.0417** | **0.0107** | **-0.0207** |
| | (0.339) | (0.125) | (0.109) | (0.318) | (0.756) | (0.628) |
| $\boldsymbol{y4_{i,t}}$ | **0.1339** | **0.0854*** | **0.1341**** | **0.1182*** | **0.0901*** | **0.0595** |
| | (0.180) | (0.062) | (0.032) | (0.081) | (0.058) | (0.276) |
| $\boldsymbol{y5_{i,t}}$ | **0.0423** | **0.0099** | **0.0536** | **0.0316** | **-0.0121** | **-0.0335** |
| | (0.419) | (0.747) | (0.151) | (0.485) | (0.754) | (0.453) |
| $\boldsymbol{y6_{i,t}}$ | **0.0142** | **0.0124** | **0.0682*** | **0.0451** | **0.0185** | **-0.0131** |
| | (0.743) | (0.660) | (0.081) | (0.309) | (0.643) | (0.770) |
| $\boldsymbol{y7_{i,t}}$ | **0.0354** | **0.0093** | **0.0787***** | **0.0537** | **0.0623** | **0.0305** |
| | (0.476) | (0.791) | (0.005) | (0.126) | (0.104) | (0.427) |
| $\boldsymbol{y8_{i,t}}$ | **-0.0208** | **0.0087** | **-0.0031** | **-0.0286** | **0.0465** | **0.0070** |
| | (0.736) | (0.798) | (0.960) | (0.680) | (0.396) | (0.909) |
| $\boldsymbol{y9_{i,t}}$ | **0.0825** | **0.0588**** | **0.0523** | **0.0295** | **0.0936**** | **0.0543** |
| | (0.172) | (0.038) | (0.141) | (0.533) | (0.029) | (0.232) |
| $\boldsymbol{y10_{i,t}}$ | **0.0700** | **0.0426** | **0.0461** | **0.0250** | **0.0926**** | **0.0644** |
| | (0.222) | (0.176) | (0.235) | (0.590) | (0.016) | (0.104) |
| $R^2$ within | 0.0192 | 0.4011 | 0.0102 | 0.0120 | 0.0185 | 0.0262 |
| F-statistic | 8.7318 | 1206.4241 | 3.3089 | 5.3366 | 8.4361 | 22.9550 |
| p-value | 0.0000 | 0.0000 | 0.0025 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 4897 | 4897 | 4897 | 4897 | 4897 | 4897 |
| Observations | 28408 | 28408 | 28408 | 28408 | 28408 | 28408 |

Table F4.B. Results for the allocation funds sample with operational year dummies. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | $R_{Fund}$-$R_{PPB}$ | | M2 | |
|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (2) | (3) | (2) | (3) |
| ***Constant*** | **-0.2054** | **-0.1389** | **0.0207** | **-0.9257**** | **-0.0119** | **-0.4962** |
| | (0.507) | (0.555) | (0.940) | (0.024) | (0.953) | (0.184) |
| $Bear_{i,t}$ | | **-0.6439***** | | **0.3674***** | | **-0.0436** |
| | | (0.000) | | (0.001) | | (0.719) |
| $Bull_{i,t}$ | | **-0.0277** | | **0.3157** | | **-0.1005** |
| | | (0.805) | | (0.123) | | (0.511) |
| $Size_{i,t-1}$ | **0.0389** | **0.0339** | **0.0557*** | **0.0969** | **0.0902**** | **0.0711** |
| | (0.372) | (0.237) | (0.054) | (0.133) | (0.010) | (0.115) |
| $Share_{i,t-1}$ | **0.0082** | **-0.0084** | **-0.0362***** | **-0.0440** | **-0.0288** | **-0.0166** |
| | (0.568) | (0.503) | (0.009) | (0.116) | (0.109) | (0.396) |
| $ABIshare_{i,t-1}$ | **0.0073** | **0.0175*** | **0.0104** | **0.0197** | **0.0178** | **0.0093** |
| | (0.619) | (0.094) | (0.703) | (0.578) | (0.459) | (0.717) |
| $p0\_5_{i,t}$ | **0.0912** | **0.1065** | **-0.3706**** | **-0.2638** | **0.2126** | **0.3434** |
| | (0.626) | (0.301) | (0.035) | (0.271) | (0.333) | (0.194) |
| $p5\_10_{i,t}$ | **-0.0285** | **0.0965** | **-0.5814**** | **-0.4539*** | **-0.0826** | **0.0636** |
| | (0.854) | (0.418) | (0.040) | (0.087) | (0.605) | (0.751) |
| $p10\_15_{i,t}$ | **0.0410** | **0.0944** | **-0.0410** | **0.0216** | **0.2457*** | **0.2851**** |
| | (0.626) | (0.160) | (0.836) | (0.905) | (0.070) | (0.036) |
| $p15\_20_{i,t}$ | **0.0458** | **0.0561** | **-0.0942** | **0.0566** | **0.1798** | **0.2010** |
| | (0.724) | (0.347) | (0.510) | (0.726) | (0.220) | (0.143) |
| $PPP_t$ | | **-0.0099** | | **0.4747** | | **0.4116** |
| | | (0.955) | | (0.200) | | (0.169) |
| $STK_t$ | | **0.1226** | | **-0.0320** | | **0.1770** |
| | | (0.234) | | (0.891) | | (0.422) |
| $y1_{i,t}$ | **0.0786** | **0.1219** | **0.0734** | **0.1297** | **-0.0697** | **-0.0181** |
| | (0.515) | (0.240) | (0.585) | (0.489) | (0.672) | (0.929) |
| $y2_{i,t}$ | **0.0042** | **0.0478** | **0.2745** | **0.3393*** | **-0.0809** | **-0.0383** |
| | (0.979) | (0.545) | (0.158) | (0.086) | (0.669) | (0.850) |
| $y3_{i,t}$ | **-0.0005** | **0.0800** | **0.1757** | **0.2544** | **-0.0778** | **-0.0457** |
| | (0.997) | (0.267) | (0.270) | (0.158) | (0.636) | (0.800) |
| $y4_{i,t}$ | **0.1556** | **0.1726**** | **0.2858*** | **0.3874**** | **0.0895** | **0.1250** |
| | (0.329) | (0.035) | (0.052) | (0.020) | (0.570) | (0.477) |
| $y5_{i,t}$ | **0.0893** | **0.0966** | **0.2079** | **0.2798*** | **0.0606** | **0.1031** |
| | (0.595) | (0.223) | (0.184) | (0.074) | (0.720) | (0.537) |
| $y6_{i,t}$ | **-0.0141** | **0.0570** | **0.2560** | **0.3189**** | **0.0077** | **0.0444** |
| | (0.816) | (0.264) | (0.109) | (0.048) | (0.950) | (0.692) |
| $y7_{i,t}$ | **0.0028** | **0.0191** | **0.1799** | **0.2596** | **0.0424** | **0.0794** |
| | (0.977) | (0.748) | (0.260) | (0.126) | (0.809) | (0.657) |
| $y8_{i,t}$ | **-0.0691** | **0.0061** | **-0.1325** | **-0.0881** | **-0.1636** | **-0.1329** |
| | (0.394) | (0.900) | (0.329) | (0.496) | (0.125) | (0.234) |
| $y9_{i,t}$ | **-0.0640** | **0.0480** | **0.0473** | **0.0972** | **-0.0150** | **0.0051** |
| | (0.329) | (0.267) | (0.609) | (0.263) | (0.787) | (0.947) |
| $y10_{i,t}$ | **0.0778** | **0.0636** | **-0.0442** | **0.0536** | **-0.0567** | **-0.0444** |
| | (0.408) | (0.139) | (0.426) | (0.458) | (0.441) | (0.615) |
| $R^2$ within | 0.0449 | 0.5134 | 0.0334 | 0.0665 | 0.0511 | 0.0551 |
| F-statistic | 234.7883 | 662.3679 | 115.7904 | 91.9362 | 150.2226 | 6582.4553 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 320 | 320 | 320 | 320 | 320 | 320 |
| Observations | 1572 | 1572 | 1572 | 1572 | 1572 | 1572 |

Table F4.C. Results for the fixed income funds sample with operational year dummies. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | $R_{Fund}$-$R_{PPB}$ | | M2 | |
|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (2) | (3) | (2) | (3) |
| ***Constant*** | **-0.1446** | **-0.0105** | **-0.1616** | **0.0166** | **-0.0280** | **0.0690** |
| | (0.134) | (0.965) | (0.394) | (0.969) | (0.839) | (0.751) |
| $Bear_{i,t}$ | | **-0.2566**** | | **0.0902** | | **0.1835***** |
| | | (0.023) | | (0.421) | | (0.003) |
| $Bull_{i,t}$ | | **0.1327** | | **-0.0337** | | **-0.0829*** |
| | | (0.235) | | (0.555) | | (0.058) |
| $Size_{i,t-1}$ | **0.0266** | **0.0556**** | **0.0522** | **0.0510** | **0.0379** | **0.0299** |
| | (0.179) | (0.021) | (0.110) | (0.113) | (0.152) | (0.229) |
| $Share_{i,t-1}$ | **0.0036** | **0.0020** | **0.0029** | **0.0024** | **0.0001** | **-0.0001** |
| | (0.145) | (0.433) | (0.648) | (0.708) | (0.985) | (0.981) |
| $ABIshare_{i,t-1}$ | **0.0010** | **-0.0096** | **0.0311*** | **0.0260** | **0.0166*** | **0.0138** |
| | (0.940) | (0.299) | (0.060) | (0.143) | (0.084) | (0.224) |
| $p0\_5_{i,t}$ | **-0.1608** | **-0.1591** | **0.1977** | **0.0853** | **0.1532** | **0.0448** |
| | (0.214) | (0.380) | (0.343) | (0.702) | (0.345) | (0.812) |
| $p5\_10_{i,t}$ | **-0.0338** | **-0.0300** | **0.0053** | **-0.0796** | **0.0137** | **-0.0616** |
| | (0.765) | (0.818) | (0.988) | (0.768) | (0.916) | (0.664) |
| $p10\_15_{i,t}$ | **-0.0174** | **-0.0338** | **0.1667** | **0.1062** | **0.1501*** | **0.0909** |
| | (0.817) | (0.749) | (0.115) | (0.382) | (0.079) | (0.387) |
| $p15\_20_{i,t}$ | **-0.0000** | **0.0156** | **0.1327*** | **0.0778** | **0.1408**** | **0.0679** |
| | (1.000) | (0.819) | (0.092) | (0.114) | (0.030) | (0.202) |
| $PPP_t$ | | **-0.0668** | | **-0.0448** | | **0.0540** |
| | | (0.582) | | (0.895) | | (0.702) |
| $STK_t$ | | **-0.1520** | | **-0.1017** | | **-0.0994** |
| | | (0.311) | | (0.265) | | (0.277) |
| $y1_{i,t}$ | **-0.0227** | **-0.0442** | **0.1222** | **0.1196** | **0.1140** | **0.1257** |
| | (0.835) | (0.726) | (0.411) | (0.418) | (0.339) | (0.299) |
| $y2_{i,t}$ | **0.0418** | **0.0065** | **0.0225** | **0.0224** | **0.0549** | **0.0716** |
| | (0.557) | (0.940) | (0.705) | (0.661) | (0.320) | (0.186) |
| $y3_{i,t}$ | **0.0835** | **0.0982** | **0.1018** | **0.0838** | **0.1037** | **0.0840** |
| | (0.188) | (0.128) | (0.449) | (0.514) | (0.277) | (0.406) |
| $y4_{i,t}$ | **0.1096** | **0.0947** | **0.2379** | **0.2225** | **0.2073*** | **0.1982*** |
| | (0.230) | (0.216) | (0.148) | (0.167) | (0.069) | (0.088) |
| $y5_{i,t}$ | **-0.0071** | **-0.0177** | **0.0539** | **0.0352** | **0.0388** | **0.0220** |
| | (0.908) | (0.781) | (0.516) | (0.664) | (0.623) | (0.790) |
| $y6_{i,t}$ | **-0.0475** | **-0.0384** | **-0.0290** | **-0.0612** | **0.0145** | **-0.0273** |
| | (0.525) | (0.625) | (0.739) | (0.406) | (0.844) | (0.707) |
| $y7_{i,t}$ | **-0.0063** | **0.0041** | **0.0803** | **0.0448** | **0.0809** | **0.0332** |
| | (0.947) | (0.967) | (0.496) | (0.657) | (0.412) | (0.712) |
| $y8_{i,t}$ | **-0.0608** | **-0.0295** | **0.0425** | **0.0001** | **0.0806** | **0.0159** |
| | (0.481) | (0.695) | (0.722) | (0.999) | (0.407) | (0.877) |
| $y9_{i,t}$ | **0.0886** | **0.0979** | **0.1119** | **0.0711** | **0.1083** | **0.0514** |
| | (0.268) | (0.179) | (0.222) | (0.348) | (0.232) | (0.516) |
| $y10_{i,t}$ | **0.0709** | **0.0782** | **0.0421** | **0.0099** | **0.1033** | **0.0571** |
| | (0.517) | (0.472) | (0.702) | (0.917) | (0.217) | (0.424) |
| $R^2$ within | 0.0269 | 0.1273 | 0.0189 | 0.0217 | 0.0167 | 0.0315 |
| F-statistic | 21.5094 | 24.3609 | 25.1748 | 36.5129 | 15.7865 | 22.9235 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 705 | 705 | 705 | 705 | 705 | 705 |
| Observations | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 |

Table F4.D. Results for the equity funds sample with operational year dummies. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | $R_{Fund}$-$R_{PPB}$ | | M2 | |
|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (2) | (3) | (2) | (3) |
| ***Constant*** | **-0.0005** | **0.1481** | **-0.0204** | **0.0186** | **-0.0987** | **0.1797** |
| | (0.997) | (0.174) | (0.796) | (0.959) | (0.307) | (0.587) |
| $Bear_{i,t}$ | | **-0.5702***** | | **0.0019** | | **-0.0839** |
| | | (0.000) | | (0.976) | | (0.221) |
| $Bull_{i,t}$ | | **0.0597** | | **0.0452** | | **-0.1945***** |
| | | (0.417) | | (0.448) | | (0.007) |
| $Size_{i,t-1}$ | **0.0053** | **0.0106** | **0.0015** | **0.0110** | **0.0473**** | **0.0352*** |
| | (0.840) | (0.370) | (0.912) | (0.378) | (0.024) | (0.051) |
| $Share_{i,t-1}$ | **0.0093*** | **0.0015** | **0.0075*** | **0.0056** | **-0.0056** | **-0.0034** |
| | (0.094) | (0.622) | (0.081) | (0.157) | (0.297) | (0.486) |
| $ABIshare_{i,t-1}$ | **-0.0049** | **-0.0035** | **0.0140**** | **0.0149**** | **0.0197***** | **0.0220***** |
| | (0.420) | (0.389) | (0.033) | (0.040) | (0.002) | (0.002) |
| $p0\_5_{i,t}$ | **0.0405** | **-0.0263** | **0.0430** | **-0.0165** | **0.2014** | **0.0862** |
| | (0.762) | (0.740) | (0.827) | (0.932) | (0.321) | (0.628) |
| $p5\_10_{i,t}$ | **-0.0879** | **-0.0236** | **-0.2620*** | **-0.3013*** | **-0.0237** | **-0.1496** |
| | (0.482) | (0.705) | (0.092) | (0.051) | (0.849) | (0.252) |
| $p10\_15_{i,t}$ | **-0.0413** | **-0.0114** | **-0.1258** | **-0.1648** | **-0.0040** | **-0.0651** |
| | (0.685) | (0.850) | (0.177) | (0.143) | (0.962) | (0.504) |
| $p15\_20_{i,t}$ | **-0.0523** | **0.0029** | **-0.0248** | **-0.0521** | **0.0897** | **0.0167** |
| | (0.540) | (0.933) | (0.693) | (0.527) | (0.130) | (0.757) |
| $PPP_t$ | | **-0.0250** | | **0.0325** | | **-0.0910** |
| | | (0.728) | | (0.912) | | (0.730) |
| $STK_t$ | | **0.0148** | | **-0.1159** | | **-0.0475** |
| | | (0.818) | | (0.289) | | (0.644) |
| $y1_{i,t}$ | **-0.0536** | **-0.0229** | **-0.1591*** | **-0.1820**** | **-0.1250** | **-0.1252** |
| | (0.513) | (0.636) | (0.059) | (0.045) | (0.103) | (0.133) |
| $y2_{i,t}$ | **0.0291** | **0.0058** | **0.0482** | **0.0249** | **-0.0472** | **-0.0606** |
| | (0.726) | (0.884) | (0.309) | (0.685) | (0.325) | (0.341) |
| $y3_{i,t}$ | **0.0544** | **0.0633** | **0.0512** | **0.0331** | **0.0141** | **-0.0173** |
| | (0.303) | (0.107) | (0.209) | (0.541) | (0.709) | (0.729) |
| $y4_{i,t}$ | **0.1310** | **0.0742**** | **0.0995**** | **0.0779** | **0.0640*** | **0.0308** |
| | (0.172) | (0.033) | (0.050) | (0.213) | (0.073) | (0.562) |
| $y5_{i,t}$ | **0.0507** | **0.0170** | **0.0401** | **0.0137** | **-0.0234** | **-0.0397** |
| | (0.317) | (0.520) | (0.413) | (0.822) | (0.571) | (0.463) |
| $y6_{i,t}$ | **0.0265** | **0.0223** | **0.0576** | **0.0314** | **0.0224** | **-0.0050** |
| | (0.596) | (0.448) | (0.193) | (0.568) | (0.655) | (0.928) |
| $y7_{i,t}$ | **0.0536** | **0.0198** | **0.0928**** | **0.0619** | **0.0841**** | **0.0551** |
| | (0.282) | (0.469) | (0.018) | (0.222) | (0.044) | (0.253) |
| $y8_{i,t}$ | **-0.0153** | **0.0225** | **0.0066** | **-0.0212** | **0.0616** | **0.0247** |
| | (0.826) | (0.452) | (0.915) | (0.762) | (0.248) | (0.682) |
| $y9_{i,t}$ | **0.0898** | **0.0512*** | **0.0473** | **0.0173** | **0.1060**** | **0.0632** |
| | (0.198) | (0.065) | (0.180) | (0.751) | (0.018) | (0.231) |
| $y10_{i,t}$ | **0.0770** | **0.0449*** | **0.0473** | **0.0191** | **0.1079**** | **0.0823*** |
| | (0.230) | (0.061) | (0.222) | (0.698) | (0.016) | (0.084) |
| $R^2$ within | 0.0238 | 0.5440 | 0.0127 | 0.0145 | 0.0283 | 0.0422 |
| F-statistic | 9.5007 | 222.8151 | 7.1091 | 17.5993 | 5.0447 | 104.4478 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0000 |
| Funds | 3571 | 3571 | 3571 | 3571 | 3571 | 3571 |
| Observations | 20985 | 20985 | 20985 | 20985 | 20985 | 20985 |

Table F4.E. Results for the emerging equity funds sample with operational year dummies. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | $R_{Fund}$-$R_{PPB}$ | | M2 | |
|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (2) | (3) | (2) | (3) |
| ***Constant*** | **-0.1375** | **0.0366** | **-0.1425** | **0.1919** | **-0.6897*****| **0.2804** |
| | (0.588) | (0.821) | (0.526) | (0.412) | (0.002) | (0.381) |
| $\boldsymbol{Bear_{i,t}}$ | | **-0.7923***** | | **-0.0204** | | **-0.3976***** |
| | | (0.000) | | (0.795) | | (0.000) |
| $\boldsymbol{Bull_{i,t}}$ | | **0.0598** | | **0.3324*** | | **-0.1077** |
| | | (0.416) | | (0.062) | | (0.569) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0792**** | **0.0442***** | **0.0596***** | **0.0756**** | **0.1547***** | **0.1510***** |
| | (0.022) | (0.001) | (0.002) | (0.018) | (0.001) | (0.001) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0145***** | **0.0019** | **0.0060** | **-0.0004** | **0.0059** | **0.0010** |
| | (0.001) | (0.446) | (0.384) | (0.957) | (0.423) | (0.897) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0109** | **0.0301**** | **0.0271** | **0.0351** | **0.0420** | **0.0417** |
| | (0.276) | (0.014) | (0.267) | (0.247) | (0.115) | (0.101) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.2864** | **0.5261***** | **0.2360** | **0.0990** | **0.5025** | **0.3659** |
| | (0.230) | (0.004) | (0.729) | (0.864) | (0.524) | (0.573) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.2680** | **0.4034**** | **-0.6066** | **-0.5026** | **-0.1719** | **-0.1551** |
| | (0.332) | (0.017) | (0.219) | (0.284) | (0.784) | (0.789) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.2905** | **0.2135** | **-0.5943** | **-0.6609*** | **-0.6520** | **-0.7219**** |
| | (0.251) | (0.245) | (0.155) | (0.075) | (0.122) | (0.034) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.1208** | **0.0777** | **-0.4121**** | **-0.5463***** | **-0.3852** | **-0.6731***** |
| | (0.426) | (0.697) | (0.046) | (0.010) | (0.216) | (0.001) |
| $\boldsymbol{PPP_t}$ | | | | | | |
| $\boldsymbol{STK_t}$ | | **0.1114** | | **-0.5190** | | **-0.5862** |
| | | (0.450) | | (0.119) | | (0.149) |
| $\boldsymbol{y1_{i,t}}$ | **-0.3466**** | **-0.2364***** | **-0.3883*** | **-0.4690*** | **-0.3445** | **-0.4922*** |
| | (0.041) | (0.002) | (0.060) | (0.082) | (0.233) | (0.068) |
| $\boldsymbol{y2_{i,t}}$ | **-0.2500**** | **-0.2122***** | **-0.2536**** | **-0.2801**** | **-0.0571** | **-0.2413*** |
| | (0.043) | (0.003) | (0.019) | (0.028) | (0.515) | (0.061) |
| $\boldsymbol{y3_{i,t}}$ | **-0.1807** | **-0.1413**** | **-0.0960** | **-0.0805** | **0.2187**** | **-0.0008** |
| | (0.303) | (0.011) | (0.443) | (0.601) | (0.017) | (0.995) |
| $\boldsymbol{y4_{i,t}}$ | **-0.1563** | **-0.1743**** | **-0.1381** | **-0.1566** | **0.1736** | **-0.0967** |
| | (0.461) | (0.015) | (0.336) | (0.380) | (0.214) | (0.589) |
| $\boldsymbol{y5_{i,t}}$ | **-0.2117***** | **-0.1095*** | **-0.0920** | **-0.0784** | **0.1194** | **-0.0476** |
| | (0.008) | (0.081) | (0.541) | (0.562) | (0.343) | (0.675) |
| $\boldsymbol{y6_{i,t}}$ | **-0.3838***** | **-0.0466** | **-0.0912** | **0.0222** | **0.2313**** | **0.1255** |
| | (0.000) | (0.433) | (0.535) | (0.901) | (0.036) | (0.410) |
| $\boldsymbol{y7_{i,t}}$ | **0.0259** | **0.0513** | **0.0165** | **0.0635** | **0.3493***** | **0.0964** |
| | (0.806) | (0.412) | (0.914) | (0.689) | (0.001) | (0.491) |
| $\boldsymbol{y8_{i,t}}$ | **-0.2527***** | **-0.1105** | **-0.3428**** | **-0.2948*** | **0.3197**** | **0.1484** |
| | (0.007) | (0.215) | (0.045) | (0.059) | (0.046) | (0.357) |
| $\boldsymbol{y9_{i,t}}$ | **-0.1575** | **-0.0392** | **-0.1091** | **-0.0094** | **0.1265** | **0.0292** |
| | (0.163) | (0.618) | (0.510) | (0.939) | (0.303) | (0.810) |
| $\boldsymbol{y10_{i,t}}$ | **-0.1209** | **0.0506** | **-0.1848** | **-0.0787** | **0.3480*** | **0.3322** |
| | (0.269) | (0.636) | (0.172) | (0.583) | (0.053) | (0.107) |
| $R^2$ within | 0.1603 | 0.7964 | 0.0645 | 0.0996 | 0.2523 | 0.3056 |
| F-statistic | 290.7758 | 70526.4848 | 3706.7113 | 43608.8637 | 207.8647 | 976.8938 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 183 | 183 | 183 | 183 | 183 | 183 |
| Observations | 713 | 713 | 713 | 713 | 713 | 713 |

Table F4.F. Results for the international equity funds sample with operational year dummies. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | $R_{Fund}$-$R_{PPB}$ | | M2 | |
|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (2) | (3) | (2) | (3) |
| ***Constant*** | **-0.1412** | **0.1534** | **-0.2914***** | **-0.3671** | **-0.2922***** | **0.1470** |
| | (0.345) | (0.279) | (0.007) | (0.338) | (0.003) | (0.679) |
| $Bear_{i,t}$ | | **-0.4349***** | | **-0.0989** | | **-0.2432**** |
| | | (0.000) | | (0.474) | | (0.026) |
| $Bull_{i,t}$ | | **0.1235*** | | **0.0354** | | **-0.2209***** |
| | | (0.065) | | (0.659) | | (0.009) |
| $Size_{i,t-1}$ | **0.0104** | **0.0244**** | **0.0226** | **0.0390***** | **0.0692**** | **0.0589***** |
| | (0.646) | (0.025) | (0.348) | (0.006) | (0.021) | (0.001) |
| $Share_{i,t-1}$ | **0.0056** | **-0.0048** | **0.0266*** | **0.0195** | **-0.0025** | **-0.0001** |
| | (0.588) | (0.349) | (0.095) | (0.133) | (0.871) | (0.995) |
| $ABIshare_{i,t-1}$ | **0.0126*** | **0.0051** | **0.0230**** | **0.0210*** | **0.0293**** | **0.0245**** |
| | (0.087) | (0.185) | (0.031) | (0.067) | (0.020) | (0.038) |
| $p0\_5_{i,t}$ | **0.0024** | **-0.0947** | **-0.1961** | **-0.2294** | **0.0756** | **-0.0648** |
| | (0.983) | (0.299) | (0.394) | (0.424) | (0.737) | (0.783) |
| $p5\_10_{i,t}$ | **-0.0757** | **-0.0567** | **-0.3540**** | **-0.3811*** | **-0.1002** | **-0.2387** |
| | (0.383) | (0.421) | (0.045) | (0.083) | (0.399) | (0.128) |
| $p10\_15_{i,t}$ | **-0.0208** | **-0.0336** | **-0.1261** | **-0.1696** | **0.0346** | **-0.0394** |
| | (0.810) | (0.610) | (0.307) | (0.274) | (0.712) | (0.721) |
| $p15\_20_{i,t}$ | **-0.0353** | **-0.0240** | **-0.0228** | **-0.0636** | **0.1079** | **0.0157** |
| | (0.604) | (0.512) | (0.817) | (0.605) | (0.195) | (0.848) |
| $PPP_t$ | | **-0.0836** | | **0.2816** | | **-0.0935** |
| | | (0.310) | | (0.287) | | (0.704) |
| $STK_t$ | | **-0.0906** | | **-0.1986** | | **-0.1125** |
| | | (0.232) | | (0.160) | | (0.213) |
| $y1_{i,t}$ | **-0.0511** | **-0.0532** | **-0.0998** | **-0.1149** | **-0.0799** | **-0.0753** |
| | (0.445) | (0.267) | (0.393) | (0.292) | (0.439) | (0.470) |
| $y2_{i,t}$ | **0.0319** | **-0.0048** | **0.0507** | **0.0264** | **-0.0210** | **-0.0421** |
| | (0.650) | (0.920) | (0.485) | (0.763) | (0.733) | (0.605) |
| $y3_{i,t}$ | **0.0647** | **0.0518** | **0.0503** | **0.0269** | **0.0282** | **-0.0032** |
| | (0.246) | (0.282) | (0.518) | (0.763) | (0.581) | (0.967) |
| $y4_{i,t}$ | **0.1237** | **0.0515** | **0.1450** | **0.1012** | **0.1281**** | **0.0736** |
| | (0.137) | (0.265) | (0.116) | (0.313) | (0.044) | (0.384) |
| $y5_{i,t}$ | **0.0644** | **0.0110** | **0.1073** | **0.0594** | **0.0390** | **0.0107** |
| | (0.275) | (0.784) | (0.198) | (0.549) | (0.561) | (0.903) |
| $y6_{i,t}$ | **0.0416** | **0.0095** | **0.0995** | **0.0493** | **0.0684** | **0.0298** |
| | (0.484) | (0.805) | (0.158) | (0.541) | (0.315) | (0.700) |
| $y7_{i,t}$ | **0.0497** | **0.0103** | **0.2072***** | **0.1476**** | **0.1663***** | **0.1109** |
| | (0.384) | (0.773) | (0.001) | (0.043) | (0.006) | (0.137) |
| $y8_{i,t}$ | **0.0013** | **0.0140** | **0.1168*** | **0.0679** | **0.1532**** | **0.0972** |
| | (0.985) | (0.729) | (0.095) | (0.404) | (0.020) | (0.197) |
| $y9_{i,t}$ | **0.0701** | **0.0399** | **0.1056*** | **0.0449** | **0.1594***** | **0.0794** |
| | (0.322) | (0.312) | (0.054) | (0.527) | (0.007) | (0.259) |
| $y10_{i,t}$ | **0.1011*** | **0.0531*** | **0.1428**** | **0.0840** | **0.1949**** | **0.1276**** |
| | (0.080) | (0.099) | (0.021) | (0.222) | (0.014) | (0.033) |
| $R^2$ within | 0.0285 | 0.4834 | 0.0260 | 0.0363 | 0.0491 | 0.0727 |
| F-statistic | 15.0885 | 36.4570 | 6.8294 | 36.3897 | 10.5481 | 46.0281 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 1892 | 1892 | 1892 | 1892 | 1892 | 1892 |
| Observations | 11574 | 11574 | 11574 | 11574 | 11574 | 11574 |

Table F4.G. Results for the UK funds sample with operational year dummies. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | $R_{Fund}$-$R_{PPB}$ | | M2 | |
|---|---|---|---|---|---|---|
| Specification | (2) | (3) | (2) | (3) | (2) | (3) |
| ***Constant*** | **0.2219**** | **0.1124** | **0.2734*** | **0.5505** | **0.2145** | **0.4670** |
| | (0.022) | (0.393) | (0.086) | (0.244) | (0.204) | (0.288) |
| $Bear_{i,t}$ | | **-0.7271***** | | **0.1467*** | | **0.1490** |
| | | (0.000) | | (0.083) | | (0.313) |
| $Bull_{i,t}$ | | **-0.0140** | | **0.0424** | | **-0.1692** |
| | | (0.868) | | (0.671) | | (0.125) |
| $Size_{i,t-1}$ | **-0.0034** | **-0.0095** | **-0.0394***** | **-0.0392***** | **0.0063** | **-0.0121** |
| | (0.922) | (0.539) | (0.000) | (0.006) | (0.635) | (0.515) |
| $Share_{i,t-1}$ | **0.0187**** | **0.0075** | **0.0082** | **0.0100** | **-0.0056** | **0.0027** |
| | (0.013) | (0.123) | (0.211) | (0.132) | (0.403) | (0.684) |
| $ABIshare_{i,t-1}$ | **-0.0214** | **-0.0149**** | **0.0057** | **0.0004** | **0.0116** | **0.0079** |
| | (0.128) | (0.015) | (0.560) | (0.960) | (0.200) | (0.202) |
| $p0\_5_{i,t}$ | **0.0009** | **0.0874** | **0.2442** | **0.1194** | **0.3068** | **0.2272** |
| | (0.996) | (0.493) | (0.320) | (0.586) | (0.210) | (0.311) |
| $p5\_10_{i,t}$ | **-0.1604** | **0.0356** | **-0.1389** | **-0.2146** | **0.0573** | **-0.0633** |
| | (0.321) | (0.726) | (0.462) | (0.178) | (0.736) | (0.726) |
| $p10\_15_{i,t}$ | **-0.1228** | **0.0195** | **-0.1478*** | **-0.1636** | **-0.0932** | **-0.1370** |
| | (0.294) | (0.798) | (0.067) | (0.220) | (0.350) | (0.351) |
| $p15\_20_{i,t}$ | **-0.0993** | **0.0584** | **-0.0509** | **-0.0545** | **0.0535** | **-0.0102** |
| | (0.352) | (0.253) | (0.372) | (0.311) | (0.419) | (0.863) |
| $PPP_t$ | | **0.0916** | | **-0.2997** | | **-0.1822** |
| | | (0.339) | | (0.434) | | (0.607) |
| $STK_t$ | | **0.2148**** | | **0.0276** | | **0.0498** |
| | | (0.023) | | (0.883) | | (0.780) |
| $y1_{i,t}$ | **-0.0565** | **0.0057** | **-0.2493***** | **-0.2714***** | **-0.1925**** | **-0.2011*** |
| | (0.592) | (0.923) | (0.008) | (0.010) | (0.025) | (0.064) |
| $y2_{i,t}$ | **-0.0009** | **0.0040** | **-0.0008** | **-0.0055** | **-0.1440*** | **-0.1441** |
| | (0.993) | (0.924) | (0.992) | (0.953) | (0.076) | (0.182) |
| $y3_{i,t}$ | **0.0104** | **0.0621** | **-0.0013** | **-0.0104** | **-0.0798** | **-0.1160** |
| | (0.876) | (0.134) | (0.983) | (0.892) | (0.197) | (0.127) |
| $y4_{i,t}$ | **0.1101** | **0.0910**** | **0.0065** | **0.0093** | **-0.0727** | **-0.0862** |
| | (0.332) | (0.027) | (0.924) | (0.915) | (0.269) | (0.321) |
| $y5_{i,t}$ | **0.0100** | **0.0060** | **-0.0787** | **-0.0787** | **-0.1526**** | **-0.1519*** |
| | (0.870) | (0.854) | (0.200) | (0.296) | (0.030) | (0.078) |
| $y6_{i,t}$ | **-0.0075** | **0.0204** | **-0.0306** | **-0.0336** | **-0.0934** | **-0.1064** |
| | (0.877) | (0.560) | (0.610) | (0.663) | (0.133) | (0.163) |
| $y7_{i,t}$ | **0.0106** | **0.0038** | **-0.0869** | **-0.0846** | **-0.0757** | **-0.0637** |
| | (0.820) | (0.922) | (0.109) | (0.275) | (0.322) | (0.443) |
| $y8_{i,t}$ | **-0.0645** | **0.0315** | **-0.1553** | **-0.1662** | **-0.1074** | **-0.1293** |
| | (0.441) | (0.459) | (0.101) | (0.140) | (0.207) | (0.197) |
| $y9_{i,t}$ | **0.0913** | **0.0582*** | **-0.0541** | **-0.0389** | **0.0064** | **0.0236** |
| | (0.203) | (0.058) | (0.241) | (0.625) | (0.930) | (0.794) |
| $y10_{i,t}$ | **0.0143** | **0.0380** | **-0.1030** | **-0.1034** | **-0.0561** | **-0.0409** |
| | (0.843) | (0.267) | (0.128) | (0.244) | (0.442) | (0.642) |
| $R^2$ within | 0.0341 | 0.6408 | 0.0207 | 0.0285 | 0.0106 | 0.0475 |
| F-statistic | 38.4544 | 2200.1798 | 108.1899 | 160.3790 | 9.4423 | 72.0941 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 1496 | 1496 | 1496 | 1496 | 1496 | 1496 |
| Observations | 8698 | 8698 | 8698 | 8698 | 8698 | 8698 |

## G. Regression results for specification (1) in the restricted samples (Chapter 3)

The estimated constant coefficient for specification (1) under the restriction that fund's age is up to 5 years, sorted by sample and performance measure. The $R^2$-within is in all cases 0 and the F-test for the significance of the regression is not applicable. The benchmark is the PPB and the panel has the yearly structure. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

**Constant Coefficient**

| **Sample** | **Sharpe** | **$R_{Fund}$-$R_{PPB}$** | **M2** | **Funds** | **Obs.** |
|---|---|---|---|---|---|
| All Funds | **0.0561** | **0.1837*** ** | **0.2505*** ** | 4713 | 15499 |
| | (0.463) | (0.000) | (0.000) | | |
| Allocation | **0.0881** | **0.2249*** ** | **0.3273*** ** | 294 | 957 |
| | (0.437) | (0.004) | (0.003) | | |
| Fixed Income | **0.0004** | **0.2187*** | **0.2421*** ** | 665 | 2161 |
| | (0.996) | (0.082) | (0.007) | | |
| Equity | **0.0673** | **0.1726*** ** | **0.2457*** ** | 3468 | 11599 |
| | (0.386) | (0.000) | (0.000) | | |
| Emerging Equity | **0.2038*** | **0.0765** | **0.2936*** | 179 | 491 |
| | (0.073) | (0.281) | (0.057) | | |
| International Equity | **0.0518** | **0.1456*** ** | **0.2137*** ** | 1827 | 6078 |
| | (0.368) | (0.007) | (0.001) | | |
| UK Equity | **0.0727** | **0.2146*** ** | **0.2797*** ** | 1462 | 5030 |
| | (0.475) | (0.000) | (0.000) | | |

# H. Results of the restricted regressions with the linear, logarithmic, and cubic root age functions (Chapter 3)

Table H.A. Results for the all-funds sample under the restriction that fund's age is up to 5 years. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.2134*** | **-0.3682** | **0.1162** | **-0.3069**** | **-0.3462** | **0.0465** | **-0.5770***** | **-0.4821*** | **-0.1263** |
| | (0.078) | (0.127) | (0.629) | (0.022) | (0.145) | (0.839) | (0.008) | (0.088) | (0.657) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0930**** | **0.0525**** | **0.0590*** | **0.3205**** | **0.1659**** | **0.2010*** | **0.4938**** | **0.2541**** | **0.3086*** |
| | (0.012) | (0.019) | (0.066) | (0.012) | (0.033) | (0.063) | (0.011) | (0.032) | (0.065) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.4314***** | **-0.1166** | **-0.2126** | **-0.3590***** | **-0.2106*** | **-0.2642** | **-0.2385** | **-0.3886**** | **-0.3985** |
| | (0.000) | (0.167) | (0.153) | (0.002) | (0.075) | (0.200) | (0.184) | (0.035) | (0.202) |
| $\boldsymbol{Bull_{i,t}}$ | **0.4205***** | **0.3858**** | **0.0915** | **0.6437***** | **0.5968**** | **0.2586** | **1.0265***** | **0.9523**** | **0.5377** |
| | (0.000) | (0.038) | (0.596) | (0.000) | (0.023) | (0.280) | (0.000) | (0.014) | (0.136) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0588***** | **0.1354***** | **0.0660**** | **0.0335**** | **0.1035**** | **0.0598** | **0.0320** | **0.1093** | **0.0656** |
| | (0.001) | (0.000) | (0.029) | (0.046) | (0.026) | (0.241) | (0.231) | (0.160) | (0.444) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0035** | **0.0074** | **0.0034** | **0.0055** | **0.0108**** | **0.0034** | **0.0054** | **0.0109**** | **0.0032** |
| | (0.217) | (0.138) | (0.506) | (0.131) | (0.046) | (0.533) | (0.132) | (0.046) | (0.562) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0069*** | **0.0276*** | **0.0267*** | **-0.0086**** | **0.0239** | **0.0249*** | **-0.0086**** | **0.0238** | **0.0250*** |
| | (0.072) | (0.073) | (0.075) | (0.039) | (0.106) | (0.073) | (0.037) | (0.105) | (0.070) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.1008** | **-0.2418** | **-0.0175** | **-0.1160** | **-0.3552** | **-0.0314** | **-0.1913** | **-0.6384** | **-0.0876** |
| | (0.606) | (0.489) | (0.964) | (0.551) | (0.362) | (0.939) | (0.417) | (0.275) | (0.869) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.0133** | **-0.6320**** | **-0.3436** | **0.0166** | **-0.8644***** | **-0.5041** | **-0.0126** | **-1.3836***** | **-0.9021**** |
| | (0.930) | (0.011) | (0.174) | (0.913) | (0.005) | (0.101) | (0.942) | (0.003) | (0.036) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.0896** | **-0.3181**** | **-0.2287** | **-0.1145** | **-0.4008**** | **-0.3245** | **-0.1609** | **-0.5619**** | **-0.4565** |
| | (0.208) | (0.016) | (0.127) | (0.193) | (0.015) | (0.115) | (0.304) | (0.025) | (0.183) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.0784** | **-0.1716*** | **-0.0035** | **0.1252*** | **-0.3109**** | **-0.0176** | **0.2222**** | **-0.5336**** | **-0.0297** |
| | (0.121) | (0.056) | (0.972) | (0.068) | (0.017) | (0.902) | (0.033) | (0.013) | (0.901) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.0210** | **0.0714** | **0.0120** | **0.0865** | **0.3188** | **0.0601** | **0.1347** | **0.5094** | **0.0986** |
| | (0.448) | (0.442) | (0.869) | (0.308) | (0.280) | (0.790) | (0.304) | (0.266) | (0.777) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **0.0119** | **0.1629**** | **0.1409**** | **0.0311** | **0.5933***** | **0.4590**** | **0.0500** | **0.9338***** | **0.7179**** |
| | (0.617) | (0.020) | (0.015) | (0.683) | (0.006) | (0.016) | (0.665) | (0.005) | (0.015) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **0.0039** | **0.0319** | **0.0190** | **0.0492** | **0.1692** | **0.1337** | **0.0793** | **0.2760** | **0.2203** |
| | (0.904) | (0.296) | (0.704) | (0.642) | (0.171) | (0.475) | (0.628) | (0.153) | (0.448) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **-0.0383**** | **0.0595*** | **-0.0013** | **-0.1178**** | **0.2509**** | **0.0055** | **-0.1806**** | **0.3949**** | **0.0126** |
| | (0.016) | (0.064) | (0.973) | (0.018) | (0.015) | (0.963) | (0.017) | (0.014) | (0.945) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **-0.0033** | **-0.0098** | **-0.0035** | **0.0016** | **-0.0113** | **-0.0058** | **0.0026** | **-0.0152** | **-0.0090** |
| | (0.306) | (0.125) | (0.617) | (0.900) | (0.748) | (0.877) | (0.901) | (0.787) | (0.883) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **-0.0361** | **0.0736***** | **0.0664*** | **-0.1337** | **0.2376***** | **0.1855** | **-0.2121** | **0.3501***** | **0.2698** |
| | (0.157) | (0.002) | (0.076) | (0.131) | (0.003) | (0.149) | (0.126) | (0.004) | (0.172) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **-0.1262***** | **-0.1114***** | **-0.0856**** | **-0.4517***** | **-0.4101***** | **-0.3211**** | **-0.6986***** | **-0.6398***** | **-0.5019**** |
| | (0.001) | (0.008) | (0.045) | (0.001) | (0.007) | (0.033) | (0.001) | (0.006) | (0.030) |
| $\boldsymbol{PPP_t}$ | **-0.0731** | **-0.0286** | **-0.2059**** | **-0.0732** | **-0.0336** | **-0.1992**** | **-0.0727** | **-0.0344** | **-0.1986**** |
| | (0.215) | (0.843) | (0.027) | (0.206) | (0.815) | (0.035) | (0.209) | (0.811) | (0.035) |
| $\boldsymbol{STK_t}$ | **0.0309** | **-0.3126***** | **-0.2049**** | **0.0278** | **-0.3227***** | **-0.2056**** | **0.0291** | **-0.3204***** | **-0.2030**** |
| | (0.701) | (0.000) | (0.029) | (0.730) | (0.000) | (0.028) | (0.716) | (0.000) | (0.028) |
| $R^2$ within | 0.4869 | 0.0320 | 0.0346 | 0.4906 | 0.0339 | 0.0357 | 0.4906 | 0.0339 | 0.0357 |
| F-statistic | 64.7670 | 35.6023 | 31.0003 | 62.1465 | 40.4355 | 20.1603 | 64.9118 | 45.2075 | 17.9065 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 4708 | 4708 | 4708 | 4708 | 4708 | 4708 | 4708 | 4708 | 4708 |
| Observations | 15372 | 15372 | 15372 | 15372 | 15372 | 15372 | 15372 | 15372 | 15372 |

Table H.B. Results for the allocation funds sample under the restriction that fund's age is up to 5 years. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.6182**** | **-1.5015***** | **-0.9103**** | **-0.9456***** | **-1.9593***** | **-1.2753***** | **-1.4040***** | **-2.8135***** | **-1.7848**** |
| | (0.029) | (0.009) | (0.023) | (0.005) | (0.004) | (0.009) | (0.004) | (0.001) | (0.021) |
| $f(age_{i,t})$ | **0.1543***** | **0.2804***** | **0.2112**** | **0.5292**** | **0.9949***** | **0.6232*** | **0.8176**** | **1.5375***** | **0.9311** |
| | (0.002) | (0.001) | (0.042) | (0.011) | (0.003) | (0.094) | (0.011) | (0.003) | (0.111) |
| $Bear_{i,t}$ | **-0.4300***** | **0.6562**** | **-0.2043** | **-0.2919** | **0.7329*** | **-0.2083** | **-0.0852** | **0.8977** | **-0.3235** |
| | (0.002) | (0.018) | (0.500) | (0.115) | (0.080) | (0.596) | (0.748) | (0.157) | (0.579) |
| $Bull_{i,t}$ | **0.5174***** | **1.2177***** | **0.4020** | **0.9031***** | **1.7801***** | **0.7754*** | **1.5383***** | **2.7205***** | **1.3958**** |
| | (0.001) | (0.001) | (0.151) | (0.004) | (0.003) | (0.079) | (0.005) | (0.002) | (0.048) |
| $Size_{i,t-1}$ | **0.1349**** | **0.3635***** | **-0.0279** | **0.1484***** | **0.3445***** | **-0.0500** | **0.1845***** | **0.4233***** | **-0.0812** |
| | (0.027) | (0.000) | (0.712) | (0.000) | (0.000) | (0.693) | (0.000) | (0.001) | (0.678) |
| $Share_{i,t-1}$ | **-0.0334** | **-0.0609** | **0.0343** | **-0.0321** | **-0.0477** | **0.0199** | **-0.0330** | **-0.0489** | **0.0171** |
| | (0.274) | (0.118) | (0.121) | (0.252) | (0.138) | (0.421) | (0.239) | (0.129) | (0.485) |
| $ABIshare_{i,t-1}$ | **0.0334** | **0.0292** | **-0.0004** | **0.0339** | **0.0226** | **0.0040** | **0.0344** | **0.0231** | **0.0052** |
| | (0.207) | (0.284) | (0.985) | (0.147) | (0.287) | (0.847) | (0.142) | (0.278) | (0.803) |
| $p0\_5_{i,t}$ | **0.3721** | **0.1596** | **0.7375** | **0.4468** | **0.7750** | **0.9604** | **0.7260** | **1.8424** | **1.6991*** |
| | (0.400) | (0.879) | (0.385) | (0.365) | (0.487) | (0.287) | (0.252) | (0.105) | (0.098) |
| $p5\_10_{i,t}$ | **-0.0267** | **-1.4812**** | **0.0700** | **-0.0470** | **-1.2824*** | **0.0878** | **-0.1646** | **-1.4286** | **0.0719** |
| | (0.933) | (0.024) | (0.908) | (0.874) | (0.056) | (0.889) | (0.621) | (0.108) | (0.932) |
| $p10\_15_{i,t}$ | **-0.1962** | **0.0012** | **0.6586*** | **-0.1951** | **0.4107** | **0.6837** | **-0.1950** | **1.0806** | **1.1029** |
| | (0.296) | (0.998) | (0.074) | (0.278) | (0.454) | (0.157) | (0.411) | (0.186) | (0.184) |
| $p15\_20_{i,t}$ | **0.4029***** | **0.7284***** | **1.1104***** | **0.4915***** | **0.8586***** | **1.3216***** | **0.7279**** | **1.1232**** | **1.8546***** |
| | (0.001) | (0.000) | (0.000) | (0.006) | (0.005) | (0.000) | (0.010) | (0.031) | (0.003) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **-0.0839** | **-0.3460***** | **-0.3184***** | **-0.3182** | **-1.2570***** | **-0.9301***** | **-0.4977** | **-1.9371***** | **-1.3990***** |
| | (0.347) | (0.000) | (0.001) | (0.277) | (0.000) | (0.004) | (0.269) | (0.000) | (0.005) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0591** | **0.0874** | **-0.0139** | **0.1266** | **0.1225** | **-0.0590** | **0.2070** | **0.2274** | **-0.0446** |
| | (0.213) | (0.462) | (0.919) | (0.363) | (0.754) | (0.895) | (0.343) | (0.706) | (0.949) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.0042** | **-0.2555**** | **-0.2150** | **-0.0173** | **-0.8140**** | **-0.5649** | **-0.0160** | **-1.2417**** | **-0.8391** |
| | (0.922) | (0.042) | (0.147) | (0.883) | (0.044) | (0.218) | (0.931) | (0.048) | (0.240) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0987**** | **-0.1271** | **-0.1961*** | **-0.2869**** | **-0.3353** | **-0.6578*** | **-0.4398**** | **-0.5048** | **-1.0094*** |
| | (0.029) | (0.142) | (0.086) | (0.049) | (0.258) | (0.066) | (0.045) | (0.263) | (0.066) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0119***** | **-0.0334***** | **0.0099** | **-0.0347**** | **-0.0853*** | **0.0471** | **-0.0567**** | **-0.1344*** | **0.0707** |
| | (0.004) | (0.001) | (0.587) | (0.024) | (0.088) | (0.526) | (0.021) | (0.087) | (0.552) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **-0.0617**** | **-0.0406** | **0.0795** | **-0.2359**** | **-0.1371** | **0.1788** | **-0.3699**** | **-0.2488** | **0.2494** |
| | (0.021) | (0.537) | (0.332) | (0.027) | (0.583) | (0.454) | (0.026) | (0.527) | (0.491) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.2019***** | **-0.3007***** | **-0.2140***** | **-0.7452***** | **-1.1027***** | **-0.7571**** | **-1.1553***** | **-1.7099***** | **-1.1558**** |
| | (0.004) | (0.000) | (0.003) | (0.008) | (0.001) | (0.024) | (0.009) | (0.001) | (0.026) |
| $PPP_t$ | **0.0216** | **0.4446** | **0.7571***** | **0.0889** | **0.5373** | **0.8838***** | **0.0896** | **0.5358** | **0.8864***** |
| | (0.907) | (0.242) | (0.006) | (0.629) | (0.173) | (0.003) | (0.628) | (0.175) | (0.003) |
| $STK_t$ | **-0.0191** | **-0.7411***** | **-0.2160** | **-0.0275** | **-0.7613***** | **-0.1591** | **-0.0257** | **-0.7566***** | **-0.1494** |
| | (0.894) | (0.001) | (0.294) | (0.849) | (0.001) | (0.398) | (0.858) | (0.001) | (0.430) |
| $R^2$ within | 0.5263 | 0.1541 | 0.1205 | 0.5339 | 0.1559 | 0.1147 | 0.5349 | 0.1560 | 0.1134 |
| F-statistic | 1041.2383 | 308.0641 | 56.3050 | 581.6588 | 166.5634 | 484.0542 | 543.6589 | 153.4805 | 985.3943 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 294 | 294 | 294 | 294 | 294 | 294 | 294 | 294 | 294 |
| Observations | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 | 950 |

Table H.C. Results for the fixed income funds sample under the restriction that fund's age is up to 5 years. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.4874***** | **-0.4994** | **-0.6709** | **-0.4673***** | **-0.2933** | **-0.6152** | **-0.6153**** | **-0.0218** | **-0.4961** |
| | (0.004) | (0.388) | (0.176) | (0.008) | (0.570) | (0.210) | (0.023) | (0.968) | (0.381) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0624** | **-0.0560** | **-0.0302** | **0.1844** | **-0.3095*** | **-0.1558** | **0.2768** | **-0.4875**** | **-0.2352** |
| | (0.308) | (0.142) | (0.469) | (0.298) | (0.050) | (0.330) | (0.290) | (0.046) | (0.339) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.4187***** | **-0.4504**** | **-0.0216** | **-0.5325***** | **-0.8166**** | **-0.2775** | **-0.6954**** | **-1.4386**** | **-0.6692** |
| | (0.002) | (0.041) | (0.897) | (0.003) | (0.030) | (0.300) | (0.014) | (0.022) | (0.135) |
| $\boldsymbol{Bull_{i,t}}$ | **0.5149***** | **0.4029** | **0.2359** | **0.7341***** | **0.5675** | **0.3397** | **1.1253***** | **0.8778** | **0.5520** |
| | (0.000) | (0.192) | (0.298) | (0.000) | (0.192) | (0.295) | (0.001) | (0.182) | (0.274) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.1079***** | **0.2452**** | **0.2109**** | **0.0487** | **0.1825**** | **0.2171***** | **0.0300** | **0.1612*** | **0.2534***** |
| | (0.001) | (0.044) | (0.011) | (0.437) | (0.024) | (0.001) | (0.759) | (0.099) | (0.004) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0040** | **-0.0045** | **-0.0068** | **0.0066*** | **0.0001** | **-0.0041** | **0.0066*** | **0.0004** | **-0.0040** |
| | (0.177) | (0.584) | (0.375) | (0.092) | (0.990) | (0.645) | (0.092) | (0.970) | (0.651) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0200** | **0.0026** | **0.0283** | **-0.0226** | **0.0100** | **0.0344** | **-0.0224** | **0.0100** | **0.0346** |
| | (0.311) | (0.953) | (0.393) | (0.239) | (0.819) | (0.270) | (0.241) | (0.817) | (0.267) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.1415** | **-1.6597** | **-1.1095** | **-0.2169** | **-1.8842** | **-1.1868** | **-0.3367** | **-2.1757** | **-1.2603** |
| | (0.659) | (0.148) | (0.199) | (0.511) | (0.128) | (0.200) | (0.414) | (0.146) | (0.250) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.4364*** | **-0.1931** | **-0.7446** | **0.4549*** | **-0.2578** | **-0.9874** | **0.5612** | **0.1547** | **-1.1431** |
| | (0.054) | (0.795) | (0.148) | (0.069) | (0.791) | (0.113) | (0.107) | (0.919) | (0.188) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.2176**** | **-0.1105** | **-0.0057** | **0.2003*** | **-0.2003** | **0.0276** | **0.2088** | **-0.1774** | **0.2525** |
| | (0.041) | (0.730) | (0.979) | (0.098) | (0.541) | (0.899) | (0.250) | (0.649) | (0.482) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.0746** | **-0.1168** | **-0.0672** | **0.0916** | **-0.1767** | **-0.0193** | **0.1088** | **-0.2335** | **0.0661** |
| | (0.563) | (0.229) | (0.472) | (0.548) | (0.264) | (0.896) | (0.645) | (0.373) | (0.785) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.0379** | **0.0718** | **0.0280** | **0.1415** | **0.3543** | **0.1194** | **0.2172** | **0.5422** | **0.1598** |
| | (0.398) | (0.552) | (0.742) | (0.313) | (0.395) | (0.663) | (0.310) | (0.392) | (0.699) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **-0.0569** | **-0.2367** | **0.0171** | **-0.1426** | **-0.5069** | **0.2090** | **-0.2107** | **-0.7709** | **0.3064** |
| | (0.336) | (0.359) | (0.887) | (0.419) | (0.523) | (0.587) | (0.434) | (0.528) | (0.603) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **-0.0105** | **-0.0225** | **-0.0869** | **-0.0214** | **-0.0429** | **-0.2609** | **-0.0270** | **-0.0569** | **-0.4060** |
| | (0.810) | (0.757) | (0.280) | (0.852) | (0.854) | (0.314) | (0.877) | (0.874) | (0.312) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **0.0014** | **0.0256** | **-0.0125** | **-0.0267** | **0.0574** | **-0.0976** | **-0.0382** | **0.0932** | **-0.1529** |
| | (0.971) | (0.579) | (0.723) | (0.823) | (0.683) | (0.409) | (0.832) | (0.666) | (0.405) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **-0.0020** | **-0.0074** | **-0.0164**** | **0.0213** | **0.0188** | **-0.0418** | **0.0336** | **0.0323** | **-0.0652** |
| | (0.810) | (0.373) | (0.030) | (0.560) | (0.688) | (0.277) | (0.575) | (0.667) | (0.285) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.0541** | **0.2174**** | **0.1243**** | **0.2050** | **0.7610**** | **0.4743**** | **0.3100** | **1.1607**** | **0.7260**** |
| | (0.217) | (0.016) | (0.044) | (0.184) | (0.027) | (0.044) | (0.189) | (0.023) | (0.041) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **-0.1376**** | **-0.1126** | **-0.0735** | **-0.4694**** | **-0.3673** | **-0.2399** | **-0.7212**** | **-0.5666** | **-0.3774** |
| | (0.018) | (0.171) | (0.264) | (0.019) | (0.188) | (0.279) | (0.018) | (0.181) | (0.266) |
| $\boldsymbol{PPP_t}$ | **-0.0610** | **0.0898** | **0.3970** | **-0.0623** | **0.0759** | **0.3915** | **-0.0613** | **0.0771** | **0.3958** |
| | (0.440) | (0.731) | (0.159) | (0.407) | (0.770) | (0.159) | (0.415) | (0.766) | (0.154) |
| $\boldsymbol{STK_t}$ | **-0.0073** | **-0.0189** | **-0.0631** | **0.0100** | **0.0437** | **-0.0310** | **0.0115** | **0.0466** | **-0.0312** |
| | (0.952) | (0.873) | (0.505) | (0.930) | (0.727) | (0.734) | (0.918) | (0.709) | (0.732) |
| $R^2$ within | 0.1920 | 0.0474 | 0.0505 | 0.1963 | 0.0488 | 0.0523 | 0.1960 | 0.0488 | 0.0523 |
| F-statistic | 56.2242 | 34.9221 | 26.3166 | 18.1240 | 31.6109 | 21.2472 | 17.7566 | 32.3713 | 21.9987 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 665 | 665 | 665 | 665 | 665 | 665 | 665 | 665 | 665 |
| Observations | 2143 | 2143 | 2143 | 2143 | 2143 | 2143 | 2143 | 2143 | 2143 |

Table H.D. Results for the equity funds sample under the restriction that fund's age is up to 5 years. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| *Constant* | -0.0647 | -0.2118 | 0.3194 | -0.1517 | -0.2018 | 0.2258 | -0.3986** | -0.3289 | 0.0430 |
| | (0.567) | (0.329) | (0.213) | (0.223) | (0.430) | (0.452) | (0.036) | (0.338) | (0.917) |
| $f(age_{i,t})$ | 0.0817*** | 0.0374 | 0.0516 | 0.2921*** | 0.1566 | 0.2128 | 0.4518*** | 0.2414 | 0.3287 |
| | (0.006) | (0.237) | (0.210) | (0.008) | (0.187) | (0.176) | (0.008) | (0.193) | (0.181) |
| $Bear_{i,t}$ | -0.4905*** | -0.1861* | -0.2547 | -0.4047*** | -0.2242 | -0.2458 | -0.2686 | -0.3454 | -0.3078 |
| | (0.000) | (0.085) | (0.152) | (0.001) | (0.138) | (0.345) | (0.127) | (0.121) | (0.438) |
| $Bull_{i,t}$ | 0.3029*** | 0.2471 | -0.0794 | 0.4938*** | 0.4544** | 0.0667 | 0.8060*** | 0.7631** | 0.2727 |
| | (0.001) | (0.116) | (0.633) | (0.001) | (0.042) | (0.790) | (0.001) | (0.024) | (0.486) |
| $Size_{i,t-1}$ | 0.0256 | 0.0571 | 0.0182 | 0.0037 | 0.0293 | 0.0226 | 0.0015 | 0.0239 | 0.0288 |
| | (0.125) | (0.148) | (0.613) | (0.838) | (0.675) | (0.711) | (0.949) | (0.823) | (0.756) |
| $Share_{i,t-1}$ | 0.0086 | 0.0245** | 0.0098 | 0.0109* | 0.0272*** | 0.0081 | 0.0108* | 0.0272*** | 0.0077 |
| | (0.122) | (0.018) | (0.312) | (0.094) | (0.010) | (0.398) | (0.093) | (0.010) | (0.422) |
| $ABIshare_{i,t-1}$ | -0.0105* | 0.0291* | 0.0276* | -0.0123* | 0.0251 | 0.0258* | -0.0123* | 0.0249 | 0.0258* |
| | (0.082) | (0.073) | (0.093) | (0.056) | (0.100) | (0.096) | (0.055) | (0.100) | (0.094) |
| $p0\_5_{i,t}$ | -0.0948 | -0.1881 | 0.1579 | -0.0761 | -0.3086 | 0.1813 | -0.1229 | -0.7038 | 0.1160 |
| | (0.663) | (0.609) | (0.690) | (0.714) | (0.383) | (0.642) | (0.605) | (0.158) | (0.816) |
| $p5\_10_{i,t}$ | -0.0616 | -0.6977*** | -0.3186 | -0.0153 | -0.9630*** | -0.4649 | -0.0388 | -1.5967*** | -0.8954* |
| | (0.715) | (0.004) | (0.244) | (0.927) | (0.001) | (0.157) | (0.835) | (0.001) | (0.057) |
| $p10\_15_{i,t}$ | -0.1118 | -0.4594*** | -0.3731** | -0.1439* | -0.5777*** | -0.5047** | -0.2031 | -0.8394** | -0.7456* |
| | (0.136) | (0.004) | (0.034) | (0.092) | (0.009) | (0.048) | (0.187) | (0.015) | (0.080) |
| $p15\_20_{i,t}$ | 0.0303 | -0.2979** | -0.0833 | 0.0625 | -0.4801*** | -0.1334 | 0.1294 | -0.7999*** | -0.2240 |
| | (0.469) | (0.013) | (0.480) | (0.265) | (0.005) | (0.393) | (0.146) | (0.004) | (0.368) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | 0.0099 | 0.1153 | 0.0200 | 0.0527 | 0.4475 | 0.0712 | 0.0832 | 0.7116 | 0.1177 |
| | (0.729) | (0.261) | (0.818) | (0.535) | (0.166) | (0.790) | (0.527) | (0.154) | (0.775) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | 0.0099 | 0.2065*** | 0.1553** | 0.0268 | 0.7297*** | 0.4961** | 0.0422 | 1.1445*** | 0.7775** |
| | (0.672) | (0.005) | (0.021) | (0.718) | (0.001) | (0.021) | (0.710) | (0.001) | (0.020) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | 0.0055 | 0.0675* | 0.0580 | 0.0667 | 0.2908* | 0.2671 | 0.1051 | 0.4625* | 0.4244 |
| | (0.871) | (0.083) | (0.313) | (0.547) | (0.070) | (0.232) | (0.538) | (0.065) | (0.220) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | -0.0282* | 0.0921** | 0.0234 | -0.0816* | 0.3635*** | 0.0963 | -0.1247* | 0.5706*** | 0.1547 |
| | (0.053) | (0.021) | (0.538) | (0.072) | (0.005) | (0.400) | (0.074) | (0.005) | (0.382) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | -0.0025 | -0.0037 | -0.0010 | 0.0020 | 0.0016 | -0.0051 | 0.0033 | 0.0047 | -0.0084 |
| | (0.336) | (0.659) | (0.876) | (0.830) | (0.968) | (0.878) | (0.827) | (0.940) | (0.876) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | -0.0413* | 0.0593** | 0.0458 | -0.1543* | 0.1642* | 0.0938 | -0.2424* | 0.2410* | 0.1322 |
| | (0.066) | (0.018) | (0.303) | (0.056) | (0.077) | (0.563) | (0.053) | (0.092) | (0.598) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | -0.0990*** | -0.0862** | -0.0546 | -0.3653*** | -0.3511** | -0.2348 | -0.5669*** | -0.5509*** | -0.3684 |
| | (0.004) | (0.023) | (0.201) | (0.004) | (0.010) | (0.165) | (0.004) | (0.009) | (0.162) |
| $PPP_t$ | -0.0586 | -0.0698 | -0.3260*** | -0.0668 | -0.0855 | -0.3294*** | -0.0667 | -0.0869 | -0.3298*** |
| | (0.378) | (0.626) | (0.004) | (0.308) | (0.548) | (0.004) | (0.310) | (0.543) | (0.004) |
| $STK_t$ | 0.0929 | -0.2546*** | -0.1280 | 0.0848 | -0.2803*** | -0.1424 | 0.0854 | -0.2792*** | -0.1412 |
| | (0.280) | (0.000) | (0.146) | (0.332) | (0.000) | (0.122) | (0.327) | (0.000) | (0.124) |
| $R^2$ within | 0.5934 | 0.0376 | 0.0443 | 0.5966 | 0.0412 | 0.0455 | 0.5965 | 0.0415 | 0.0456 |
| F-statistic | 315.0963 | 31.7705 | 26.2101 | 450.2098 | 53.7277 | 21.5626 | 477.9446 | 56.1849 | 22.1569 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 3468 | 3468 | 3468 | 3468 | 3468 | 3468 | 3468 | 3468 | 3468 |
| Observations | 11512 | 11512 | 11512 | 11512 | 11512 | 11512 | 11512 | 11512 | 11512 |

Table H.E. Results for the emerging equity funds sample under the restriction that fund's age is up to 5 years. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.0800** | **-0.8062***** | **-0.7550***** | **-0.0546** | **-1.2414***** | **-1.2532***** | **-0.1056** | **-2.0833***** | **-2.2848***** |
| | (0.599) | (0.000) | (0.005) | (0.808) | (0.000) | (0.000) | (0.804) | (0.000) | (0.000) |
| $f(age_{i,t})$ | **0.0261** | **0.2528***** | **0.2747**** | **0.0824** | **1.1006***** | **1.2715***** | **0.0916** | **1.4870***** | **1.7836**** |
| | (0.688) | (0.004) | (0.026) | (0.782) | (0.002) | (0.004) | (0.839) | (0.009) | (0.015) |
| $Bear_{i,t}$ | **-0.9425***** | **-0.4575**** | **-0.6757***** | **-0.9138***** | **-0.2623** | **-0.4223** | **-0.9655**** | **-0.6007** | **-0.5687** |
| | (0.000) | (0.011) | (0.009) | (0.000) | (0.346) | (0.209) | (0.015) | (0.191) | (0.331) |
| $Bull_{i,t}$ | **0.1582** | **1.3641***** | **0.7457**** | **0.2240** | **2.1963***** | **1.5316***** | **0.2400** | **2.9234***** | **2.1940**** |
| | (0.214) | (0.000) | (0.027) | (0.443) | (0.000) | (0.002) | (0.615) | (0.000) | (0.018) |
| $Size_{i,t-1}$ | **-0.0666*** | **0.0682** | **0.2435***** | **-0.1044*** | **0.0260** | **0.2343***** | **-0.1425*** | **0.0538** | **0.3402**** |
| | (0.069) | (0.112) | (0.000) | (0.065) | (0.765) | (0.007) | (0.074) | (0.655) | (0.015) |
| $Share_{i,t-1}$ | **0.0043** | **0.0208**** | **0.0008** | **0.0036** | **0.0167**** | **-0.0014** | **0.0027** | **0.0119*** | **-0.0067** |
| | (0.416) | (0.030) | (0.947) | (0.535) | (0.042) | (0.885) | (0.645) | (0.098) | (0.521) |
| $ABIshare_{i,t-1}$ | **0.0765***** | **0.0082** | **0.0138** | **0.0767***** | **-0.0075** | **0.0022** | **0.0769***** | **-0.0037** | **0.0059** |
| | (0.001) | (0.778) | (0.732) | (0.002) | (0.834) | (0.960) | (0.002) | (0.922) | (0.893) |
| $p0\_5_{i,t}$ | **0.3139** | **0.1956** | **0.2190** | **0.1615** | **0.5938** | **0.7845** | **-0.1715** | **1.0988** | **1.1727** |
| | (0.287) | (0.772) | (0.696) | (0.664) | (0.444) | (0.245) | (0.712) | (0.285) | (0.178) |
| $p5\_10_{i,t}$ | **-0.4378** | **-0.7363** | **-0.8210** | **-0.9532** | **-0.6852** | **-0.9233** | **-1.9242** | **-1.6566** | **-2.2298** |
| | (0.406) | (0.275) | (0.370) | (0.228) | (0.429) | (0.413) | (0.110) | (0.202) | (0.209) |
| $p10\_15_{i,t}$ | **0.5660**** | **-1.1126*** | **-0.5516** | **0.6924**** | **-1.2091** | **-0.5470** | **1.0497**** | **-1.5925** | **-0.4673** |
| | (0.024) | (0.098) | (0.325) | (0.036) | (0.191) | (0.413) | (0.022) | (0.242) | (0.661) |
| $p15\_20_{i,t}$ | **-0.4987*** | **-0.0189** | **-0.8900**** | **-0.8657** | **0.0898** | **-1.3412**** | **-1.5715*** | **-0.0118** | **-2.6089**** |
| | (0.059) | (0.972) | (0.042) | (0.103) | (0.909) | (0.048) | (0.083) | (0.993) | (0.032) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.1694**** | **-0.3324***** | **-0.1077** | **0.4517**** | **-0.6205** | **-0.3586** | **0.6919**** | **-0.7596** | **-0.4518** |
| | (0.045) | (0.003) | (0.245) | (0.018) | (0.102) | (0.231) | (0.012) | (0.210) | (0.336) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.3385**** | **0.3327** | **0.4581** | **1.0835**** | **0.8865** | **1.3232** | **1.7452**** | **1.6446*** | **2.3024*** |
| | (0.040) | (0.130) | (0.168) | (0.038) | (0.137) | (0.126) | (0.030) | (0.071) | (0.082) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.1271**** | **0.1479** | **-0.0491** | **-0.3935*** | **0.6214** | **0.1057** | **-0.5967*** | **0.9795** | **0.1686** |
| | (0.037) | (0.357) | (0.806) | (0.065) | (0.288) | (0.841) | (0.069) | (0.290) | (0.839) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **0.1792**** | **-0.2508** | **0.1716** | **0.6757** | **-0.5417** | **0.8136** | **1.1469*** | **-0.4099** | **1.7002*** |
| | (0.019) | (0.240) | (0.104) | (0.112) | (0.440) | (0.131) | (0.090) | (0.681) | (0.059) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0147**** | **0.0077** | **-0.0129** | **0.0571**** | **0.0440** | **-0.0341** | **0.0843**** | **0.0430** | **-0.0845** |
| | (0.012) | (0.384) | (0.150) | (0.026) | (0.400) | (0.544) | (0.039) | (0.571) | (0.342) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0529** | **0.3278***** | **0.2320**** | **0.0972** | **0.5646**** | **0.3075** | **0.1228** | **0.7465**** | **0.3709** |
| | (0.193) | (0.000) | (0.017) | (0.612) | (0.014) | (0.240) | (0.682) | (0.036) | (0.383) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0141** | **-0.2337***** | **-0.1986*** | **-0.0716** | **-1.1392***** | **-1.0298**** | **-0.0819** | **-1.6052***** | **-1.4555*** |
| | (0.760) | (0.004) | (0.085) | (0.752) | (0.002) | (0.023) | (0.814) | (0.006) | (0.055) |
| $PPP_t$ | | | | | | | | | |
| $STK_t$ | **0.2125** | **-0.8410***** | **-0.7360*** | **0.1896** | **-0.9960***** | **-0.9747***** | **0.2030** | **-0.9126***** | **-0.9008**** |
| | (0.211) | (0.002) | (0.059) | (0.369) | (0.000) | (0.008) | (0.327) | (0.000) | (0.016) |
| $R^2$ within | 0.8803 | 0.2541 | 0.3937 | 0.8775 | 0.2446 | 0.3924 | 0.8760 | 0.2355 | 0.3856 |
| F-statistic | 507056.3203 | 4585.0386 | 50841.0467 | 4378.0277 | 26603.0972 | 34108.4242 | 2919.9127 | 446397.2402 | 27287.6069 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 179 | 179 | 179 | 179 | 179 | 179 | 179 | 179 | 179 |
| Observations | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 | 490 |

Table H.F. Results for the international equity funds sample under the restriction that fund's age is up to 5 years. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.1314** | **-0.1627** | **0.7723*** ** | **-0.2179** | **-0.1402** | **0.6494*** ** | **-0.4662** ** | **-0.2794** | **0.4223** |
| | (0.400) | (0.598) | (0.000) | (0.170) | (0.660) | (0.010) | (0.014) | (0.454) | (0.189) |
| $f(age_{i,t})$ | **0.0818*** ** | **0.0493** | **0.0674** | **0.2938*** ** | **0.1860** | **0.2706** | **0.4532*** ** | **0.2816** | **0.4161** |
| | (0.003) | (0.276) | (0.149) | (0.002) | (0.285) | (0.124) | (0.002) | (0.294) | (0.125) |
| $Bear_{i,t}$ | **-0.3506*** ** | **-0.2512* ** | **-0.3902*** ** | **-0.2622** ** | **-0.2096** | **-0.2950* ** | **-0.1229** | **-0.2180** | **-0.2509** |
| | (0.000) | (0.076) | (0.001) | (0.013) | (0.163) | (0.063) | (0.417) | (0.246) | (0.308) |
| $Bull_{i,t}$ | **0.3231*** ** | **0.4188*** ** | **0.0697** | **0.4708*** ** | **0.7638*** ** | **0.3418* ** | **0.7074*** ** | **1.2721*** ** | **0.7354** ** |
| | (0.000) | (0.007) | (0.580) | (0.000) | (0.002) | (0.076) | (0.000) | (0.001) | (0.020) |
| $Size_{i,t-1}$ | **0.0577** ** | **0.0692** | **0.0290** | **0.0424** | **0.0237** | **0.0253** | **0.0522** | **-0.0099** | **0.0153** |
| | (0.011) | (0.303) | (0.463) | (0.174) | (0.832) | (0.751) | (0.221) | (0.952) | (0.900) |
| $Share_{i,t-1}$ | **-0.0050** | **0.0295** | **0.0116** | **-0.0016** | **0.0353** | **0.0095** | **-0.0018** | **0.0358** | **0.0089** |
| | (0.555) | (0.332) | (0.639) | (0.868) | (0.251) | (0.711) | (0.852) | (0.248) | (0.730) |
| $ABIshare_{i,t-1}$ | **-0.0038** | **0.0133** | **-0.0019** | **-0.0076** | **0.0033** | **-0.0051** | **-0.0076** | **0.0025** | **-0.0051** |
| | (0.474) | (0.598) | (0.934) | (0.224) | (0.901) | (0.833) | (0.225) | (0.923) | (0.836) |
| $p0\_5_{i,t}$ | **0.0566** | **-0.7304* ** | **-0.3869** | **0.0481** | **-0.9832** ** | **-0.4752** | **-0.0297** | **-1.4085** ** | **-0.6207** |
| | (0.826) | (0.055) | (0.262) | (0.859) | (0.042) | (0.286) | (0.929) | (0.046) | (0.376) |
| $p5\_10_{i,t}$ | **-0.0501** | **-1.2357*** ** | **-1.0034*** ** | **-0.0474** | **-1.7601*** ** | **-1.3783*** ** | **-0.1707** | **-2.8332*** ** | **-2.2807*** ** |
| | (0.784) | (0.001) | (0.003) | (0.800) | (0.001) | (0.002) | (0.442) | (0.000) | (0.001) |
| $p10\_15_{i,t}$ | **-0.0745** | **-0.5679** ** | **-0.5005** ** | **-0.1122** | **-0.6757** ** | **-0.5963** ** | **-0.1954** | **-0.9276* ** | **-0.8323* ** |
| | (0.474) | (0.017) | (0.015) | (0.328) | (0.032) | (0.035) | (0.302) | (0.053) | (0.075) |
| $p15\_20_{i,t}$ | **0.0992* ** | **-0.3330** ** | **-0.1503** | **0.1348* ** | **-0.6630** ** | **-0.3442* ** | **0.2344* ** | **-1.1277** ** | **-0.5855* ** |
| | (0.098) | (0.040) | (0.254) | (0.097) | (0.016) | (0.097) | (0.058) | (0.013) | (0.082) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.0231** | **0.0960** | **0.0212** | **0.0858** | **0.4702** | **0.1525** | **0.1363** | **0.7536** | **0.2536** |
| | (0.520) | (0.402) | (0.856) | (0.408) | (0.166) | (0.662) | (0.388) | (0.149) | (0.634) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0527** | **0.3622*** ** | **0.3298*** ** | **0.1459** | **1.2397*** ** | **1.0466*** ** | **0.2252** | **1.9380*** ** | **1.6334*** ** |
| | (0.150) | (0.003) | (0.001) | (0.173) | (0.001) | (0.001) | (0.171) | (0.001) | (0.001) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0159** | **0.0683** | **0.0613** | **0.0962** | **0.2780** | **0.2617** | **0.1500** | **0.4434** | **0.4164** |
| | (0.681) | (0.234) | (0.315) | (0.451) | (0.194) | (0.273) | (0.448) | (0.184) | (0.262) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0454** ** | **0.1115* ** | **0.0422** | **-0.1225** ** | **0.5185** ** | **0.2624* ** | **-0.1864** ** | **0.8197** ** | **0.4194* ** |
| | (0.011) | (0.072) | (0.342) | (0.029) | (0.017) | (0.089) | (0.031) | (0.016) | (0.083) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0061* ** | **0.0030** | **0.0035** | **-0.0112** | **0.0300** | **0.0128** | **-0.0173** | **0.0507** | **0.0198** |
| | (0.054) | (0.813) | (0.683) | (0.340) | (0.594) | (0.753) | (0.370) | (0.575) | (0.764) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **-0.0419* ** | **0.0212** | **0.0176** | **-0.1605** ** | **0.0193** | **-0.0368** | **-0.2506** ** | **0.0245** | **-0.0662** |
| | (0.067) | (0.391) | (0.594) | (0.031) | (0.818) | (0.752) | (0.026) | (0.851) | (0.715) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0743*** ** | **-0.1434*** ** | **-0.1092*** ** | **-0.2780*** ** | **-0.5855*** ** | **-0.4542*** ** | **-0.4307*** ** | **-0.9139*** ** | **-0.7087*** ** |
| | (0.001) | (0.004) | (0.009) | (0.000) | (0.001) | (0.003) | (0.000) | (0.001) | (0.003) |
| $PPP_t$ | **-0.0537** | **-0.0561** | **-0.5435*** ** | **-0.0603** | **-0.0762** | **-0.5493*** ** | **-0.0602** | **-0.0786** | **-0.5508*** ** |
| | (0.496) | (0.768) | (0.001) | (0.437) | (0.672) | (0.001) | (0.439) | (0.662) | (0.001) |
| $STK_t$ | **-0.0271** | **-0.2710** | **-0.1853** | **-0.0312** | **-0.2883** | **-0.1982** | **-0.0303** | **-0.2855** | **-0.1963** |
| | (0.790) | (0.268) | (0.159) | (0.760) | (0.218) | (0.122) | (0.766) | (0.220) | (0.122) |
| $R^2$ within | 0.5464 | 0.0797 | 0.0940 | 0.5495 | 0.0870 | 0.0975 | 0.5494 | 0.0875 | 0.0978 |
| F-statistic | 117.4602 | 20.4442 | 50.0041 | 252.6369 | 28.1186 | 46.0814 | 243.0890 | 27.4352 | 48.1533 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 1827 | 1827 | 1827 | 1827 | 1827 | 1827 | 1827 | 1827 | 1827 |
| Observations | 6041 | 6041 | 6041 | 6041 | 6041 | 6041 | 6041 | 6041 | 6041 |

Table H.G. Results for the UK equity funds sample under the restriction that fund's age is up to 5 years. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.0721** | **0.2801** | **0.2978** | **-0.1516** | **0.2884** | **0.2379** | **-0.3904** | **0.1478** | **0.0839** |
| | (0.525) | (0.530) | (0.407) | (0.290) | (0.555) | (0.557) | (0.145) | (0.814) | (0.876) |
| $f(age_{i,t})$ | **0.0783*** | **0.0384** | **0.0465** | **0.2806** | **0.1688** | **0.1848** | **0.4354** | **0.2663** | **0.2865** |
| | (0.081) | (0.585) | (0.463) | (0.104) | (0.472) | (0.414) | (0.105) | (0.470) | (0.422) |
| $Bear_{i,t}$ | **-0.6215***** | **0.0265** | **0.0316** | **-0.5521***** | **-0.0428** | **0.0166** | **-0.4284** | **-0.1509** | **-0.0199** |
| | (0.000) | (0.816) | (0.910) | (0.002) | (0.794) | (0.967) | (0.112) | (0.549) | (0.973) |
| $Bull_{i,t}$ | **0.2826**** | **-0.0401** | **-0.3517** | **0.5205**** | **0.0071** | **-0.3595** | **0.9161**** | **0.0776** | **-0.3945** |
| | (0.048) | (0.870) | (0.130) | (0.037) | (0.983) | (0.315) | (0.037) | (0.881) | (0.480) |
| $Size_{i,t-1}$ | **-0.0035** | **-0.0039** | **-0.0901*** | **-0.0323** | **-0.0161** | **-0.0745** | **-0.0429** | **0.0022** | **-0.0672** |
| | (0.914) | (0.906) | (0.082) | (0.275) | (0.766) | (0.307) | (0.152) | (0.979) | (0.507) |
| $Share_{i,t-1}$ | **0.0171*** | **0.0370***** | **0.0278**** | **0.0198*** | **0.0385***** | **0.0236**** | **0.0197*** | **0.0387***** | **0.0235**** |
| | (0.083) | (0.006) | (0.016) | (0.080) | (0.004) | (0.037) | (0.078) | (0.005) | (0.039) |
| $ABIshare_{i,t-1}$ | **-0.0136** | **0.0238** | **0.0234** | **-0.0141** | **0.0214** | **0.0223** | **-0.0141** | **0.0213** | **0.0222** |
| | (0.115) | (0.320) | (0.198) | (0.111) | (0.345) | (0.192) | (0.110) | (0.344) | (0.191) |
| $p0\_5_{i,t}$ | **-0.3531** | **0.1781** | **0.7166** | **-0.3005** | **0.2489** | **0.8813*** | **-0.2966** | **-0.0923** | **0.8995*** |
| | (0.134) | (0.785) | (0.203) | (0.148) | (0.673) | (0.079) | (0.193) | (0.894) | (0.099) |
| $p5\_10_{i,t}$ | **-0.1169** | **-0.2261** | **0.4509** | **0.0100** | **-0.1539** | **0.5616** | **0.1593** | **-0.2406** | **0.6592** |
| | (0.483) | (0.470) | (0.153) | (0.952) | (0.670) | (0.105) | (0.496) | (0.682) | (0.222) |
| $p10\_15_{i,t}$ | **-0.1903**** | **-0.3722**** | **-0.2640** | **-0.2081**** | **-0.5164**** | **-0.4874** | **-0.2398*** | **-0.7980**** | **-0.8207** |
| | (0.011) | (0.032) | (0.216) | (0.011) | (0.030) | (0.105) | (0.098) | (0.049) | (0.101) |
| $p15\_20_{i,t}$ | **-0.0176** | **-0.3408** | **-0.0958** | **0.0309** | **-0.4111** | **-0.0485** | **0.1001** | **-0.6263** | **-0.0353** |
| | (0.756) | (0.105) | (0.635) | (0.672) | (0.107) | (0.845) | (0.410) | (0.110) | (0.929) |
| $f(age_{i,t})\cdot p0\_5_{i,t}$ | **-0.0108** | **0.1176** | **0.0067** | **-0.0016** | **0.3997** | **-0.0115** | **-0.0040** | **0.6354** | **-0.0155** |
| | (0.800) | (0.413) | (0.955) | (0.990) | (0.393) | (0.975) | (0.985) | (0.381) | (0.978) |
| $f(age_{i,t})\cdot p5\_10_{i,t}$ | **-0.0622*** | **-0.0069** | **-0.0620** | **-0.1827** | **0.0846** | **-0.1319** | **-0.2779** | **0.1523** | **-0.1866** |
| | (0.097) | (0.951) | (0.519) | (0.161) | (0.805) | (0.676) | (0.168) | (0.773) | (0.703) |
| $f(age_{i,t})\cdot p10\_15_{i,t}$ | **-0.0060** | **0.0533** | **0.0707** | **0.0312** | **0.3153** | **0.3748** | **0.0517** | **0.5024** | **0.5936** |
| | (0.841) | (0.389) | (0.341) | (0.760) | (0.155) | (0.157) | (0.740) | (0.145) | (0.147) |
| $f(age_{i,t})\cdot p15\_20_{i,t}$ | **-0.0220** | **0.0834** | **0.0135** | **-0.0796** | **0.2544** | **-0.0175** | **-0.1251** | **0.3937** | **-0.0263** |
| | (0.248) | (0.134) | (0.828) | (0.215) | (0.124) | (0.925) | (0.209) | (0.125) | (0.926) |
| $f(age_{i,t})\cdot Size_{i,t-1}$ | **0.0003** | **-0.0099** | **-0.0000** | **0.0126** | **-0.0264** | **-0.0090** | **0.0195** | **-0.0389** | **-0.0136** |
| | (0.916) | (0.268) | (0.997) | (0.144) | (0.440) | (0.799) | (0.147) | (0.477) | (0.813) |
| $f(age_{i,t})\cdot Bear_{i,t}$ | **-0.0412** | **0.0386** | **0.0198** | **-0.1380** | **0.1445** | **0.0584** | **-0.2181** | **0.2135** | **0.0809** |
| | (0.231) | (0.205) | (0.749) | (0.280) | (0.175) | (0.799) | (0.275) | (0.197) | (0.819) |
| $f(age_{i,t})\cdot Bull_{i,t}$ | **-0.1263**** | **-0.0167** | **0.0164** | **-0.4622**** | **-0.0691** | **0.0462** | **-0.7177**** | **-0.1151** | **0.0685** |
| | (0.040) | (0.788) | (0.781) | (0.038) | (0.750) | (0.844) | (0.039) | (0.733) | (0.853) |
| $PPP_t$ | **-0.0049** | **-0.3131*** | **-0.0617** | **-0.0237** | **-0.3425*** | **-0.0893** | **-0.0244** | **-0.3466*** | **-0.0918** |
| | (0.946) | (0.087) | (0.730) | (0.745) | (0.056) | (0.627) | (0.738) | (0.054) | (0.618) |
| $STK_t$ | **0.2743**** | **-0.2941** | **-0.1343** | **0.2615**** | **-0.3213** | **-0.1422** | **0.2617**** | **-0.3231** | **-0.1424** |
| | (0.017) | (0.181) | (0.436) | (0.024) | (0.133) | (0.432) | (0.024) | (0.130) | (0.433) |
| $R^2$ within | 0.6566 | 0.0347 | 0.0623 | 0.6596 | 0.0368 | 0.0630 | 0.6597 | 0.0370 | 0.0629 |
| F-statistic | 884.1859 | 78.6325 | 80.8514 | 1080.0429 | 125.1562 | 76.2454 | 1076.1438 | 127.5000 | 74.2406 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 1462 | 1462 | 1462 | 1462 | 1462 | 1462 | 1462 | 1462 | 1462 |
| Observations | 4981 | 4981 | 4981 | 4981 | 4981 | 4981 | 4981 | 4981 | 4981 |

# I. Results for the inception decades with the linear, logarithmic, and cubic root functions (Chapter 3)

Table I1.A. Results for the all-funds sample with $f(age_{i,t}) = age_{i,t}$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **0.0486** | **0.1184*** | **-0.0363** | **-0.0886** | **0.2819** | **0.0035** | **-0.0609** | **-0.1301** | **-0.0684** | **0.3457**** |
| | (0.434) | (0.083) | (0.670) | (0.394) | (0.130) | (0.964) | (0.530) | (0.238) | (0.526) | (0.039) |
| $f(age_{i,t})$ | **-0.0029** | **-0.0149** | **0.0099** | **0.0018** | **-0.0118** | **-0.0003** | **0.0150** | **0.0226**** | **0.0033** | **-0.0143** |
| | (0.656) | (0.326) | (0.268) | (0.773) | (0.107) | (0.966) | (0.276) | (0.031) | (0.644) | (0.131) |
| $Bear_{i,t}$ | **-0.5333***** | **-0.5884***** | **-0.4457***** | **-0.4328***** | **-0.3517***** | **-0.5564***** | **-0.5259***** | **-0.2962**** | **-0.4164***** | **-0.4940***** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.029) | (0.000) | (0.002) |
| $Bull_{i,t}$ | **0.0632** | **0.0095** | **0.1386*** | **0.1432**** | **0.2095**** | **0.0922** | **0.1683** | **0.3847***** | **0.3413***** | **0.5084**** |
| | (0.396) | (0.900) | (0.098) | (0.037) | (0.036) | (0.172) | (0.125) | (0.000) | (0.008) | (0.018) |
| $Size_{i,t-1}$ | **0.0230** | **0.0407**** | **-0.0065** | **0.0010** | **0.0550*** | **0.0413*** | **0.0781**** | **-0.0388** | **-0.0741** | **-0.1495** |
| | (0.139) | (0.010) | (0.627) | (0.939) | (0.073) | (0.069) | (0.013) | (0.175) | (0.121) | (0.246) |
| $Share_{i,t-1}$ | **0.0005** | **-0.0003** | **0.0010** | **0.0012** | **0.0004** | **-0.0004** | **-0.0056** | **0.0025** | **0.0025** | **-0.0008** |
| | (0.813) | (0.958) | (0.607) | (0.429) | (0.929) | (0.869) | (0.400) | (0.129) | (0.106) | (0.878) |
| $ABIshare_{i,t-1}$ | **0.0012** | **-0.0040** | **-0.0004** | **0.0058** | **-0.0152** | **0.0004** | **-0.0001** | **0.0002** | **0.0062** | **-0.0071** |
| | (0.699) | (0.507) | (0.856) | (0.243) | (0.240) | (0.876) | (0.982) | (0.933) | (0.188) | (0.564) |
| $p0\_5_{i,t}$ | **-0.0116** | **-0.3613*** | **0.2534*** | **0.0610** | **-0.0547** | **-0.0943** | **-0.5261*** | **0.5077** | **-0.0193** | **-0.3585** |
| | (0.917) | (0.065) | (0.086) | (0.626) | (0.803) | (0.484) | (0.078) | (0.169) | (0.896) | (0.124) |
| $p5\_10_{i,t}$ | **0.0182** | **-0.2341** | **0.1267** | **0.0517** | **-0.0531** | **0.0177** | **-0.4398**** | **0.0863** | **-0.0699** | **-0.1934** |
| | (0.840) | (0.159) | (0.133) | (0.636) | (0.758) | (0.861) | (0.029) | (0.452) | (0.625) | (0.568) |
| $p10\_15_{i,t}$ | **0.0262** | **-0.2368***** | **0.1137** | **0.0709** | **-0.1050** | **-0.0230** | **-0.2400***** | **0.0424** | **-0.0677** | **-0.0839** |
| | (0.710) | (0.006) | (0.199) | (0.345) | (0.372) | (0.798) | (0.006) | (0.734) | (0.545) | (0.773) |
| $p15\_20_{i,t}$ | **0.0417** | **-0.0484** | **0.0388** | **0.0381** | **0.0851** | **0.0179** | **0.0435** | **-0.0240** | **-0.0244** | **-0.2159** |
| | (0.415) | (0.307) | (0.476) | (0.410) | (0.361) | (0.752) | (0.493) | (0.686) | (0.774) | (0.243) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | | | | **0.0455** | **0.0850***** | **-0.0646** | **0.0125** | **0.0513**** |
| | | | | | | (0.106) | (0.009) | (0.555) | (0.619) | (0.039) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | | | | **0.0050** | **0.0450** | **0.0211** | **0.0136** | **0.0078** |
| | | | | | | (0.607) | (0.178) | (0.143) | (0.463) | (0.775) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | | | | **0.0073** | **-0.0181** | **0.0195*** | **0.0136** | **-0.0029** |
| | | | | | | (0.131) | (0.352) | (0.086) | (0.138) | (0.876) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | | | | **0.0024** | **-0.0338** | **0.0114*** | **0.0035** | **0.0181**** |
| | | | | | | (0.382) | (0.164) | (0.092) | (0.527) | (0.044) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | | | | **-0.0014**** | **-0.0054**** | **0.0021** | **0.0032** | **0.0064** |
| | | | | | | (0.025) | (0.020) | (0.190) | (0.162) | (0.115) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | | | | **0.0046** | **-0.0141** | **-0.0192**** | **-0.0013** | **0.0056** |
| | | | | | | (0.195) | (0.213) | (0.043) | (0.861) | (0.473) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | | | | **-0.0029** | **-0.0448***** | **-0.0308***** | **-0.0140*** | **-0.0127** |
| | | | | | | (0.350) | (0.009) | (0.000) | (0.087) | (0.217) |
| $R^2$ within | 0.3960 | 0.4706 | 0.3755 | 0.2909 | 0.3525 | 0.4004 | 0.4805 | 0.4101 | 0.3112 | 0.3954 |
| F-statistic | 41.8969 | 204254.9230 | 46.1868 | 29.9015 | 9.7116 | 57.8460 | 435.5905 | 643.8404 | 22.6813 | 17.6327 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table I1.B. Results for the all-funds sample with $f(age_{i,t}) = age_{i,t}$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | $R_{Fund}$-$R_{PPB}$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **-0.0139** | **-0.1259** | **0.0908** | **-0.0799** | **-0.0863** | **-0.0975** | **-0.2582** | **0.0840** | **-0.3085** | **-0.2078** |
| | (0.907) | (0.536) | (0.534) | (0.726) | (0.815) | (0.536) | (0.182) | (0.664) | (0.267) | (0.705) |
| $f(age_{i,t})$ | **-0.0140*** | **-0.0317*** | **0.0052** | **-0.0068** | **-0.0109** | **-0.0083** | **-0.0200** | **0.0042** | **0.0075** | **-0.0117** |
| | (0.065) | (0.084) | (0.469) | (0.346) | (0.396) | (0.277) | (0.447) | (0.753) | (0.444) | (0.444) |
| $Bear_{i,t}$ | **0.0398** | **0.0075** | **0.1455** | **0.1297** | **-0.0824** | **0.0180** | **-0.1220*** | **0.1487** | **0.3853**** | **-1.3831*** |
| | (0.371) | (0.899) | (0.177) | (0.186) | (0.714) | (0.702) | (0.086) | (0.456) | (0.014) | (0.060) |
| $Bull_{i,t}$ | **0.0475** | **0.0642** | **0.0646** | **0.0842** | **0.1251** | **0.0877** | **0.0525** | **0.2032** | **0.2831** | **0.8460** |
| | (0.434) | (0.555) | (0.470) | (0.267) | (0.264) | (0.306) | (0.458) | (0.212) | (0.146) | (0.215) |
| $Size_{i,t-1}$ | **0.0361*** | **0.0745*** | **-0.0238** | **0.0165** | **0.0458** | **0.0705*** | **0.1510***** | **-0.0910*** | **0.0866*** | **0.0867** |
| | (0.098) | (0.068) | (0.309) | (0.341) | (0.119) | (0.053) | (0.003) | (0.071) | (0.065) | (0.793) |
| $Share_{i,t-1}$ | **0.0053*** | **0.0040** | **0.0062** | **0.0043** | **0.0074** | **0.0038** | **-0.0076** | **0.0084**** | **0.0044** | **-0.0017** |
| | (0.067) | (0.233) | (0.132) | (0.376) | (0.625) | (0.182) | (0.119) | (0.044) | (0.377) | (0.932) |
| $ABIshare_{i,t-1}$ | **0.0137***** | **0.0081** | **0.0048** | **0.0270**** | **0.0349**** | **0.0120***** | **0.0117*** | **0.0052** | **0.0282**** | **0.0568**** |
| | (0.003) | (0.159) | (0.225) | (0.016) | (0.028) | (0.005) | (0.053) | (0.193) | (0.011) | (0.041) |
| $p0\_5_{i,t}$ | **-0.1209** | **-0.5783*** | **-0.1544** | **0.1642** | **0.2795** | **-0.2350** | **-0.7830** | **1.2037** | **0.1545** | **0.4501** |
| | (0.559) | (0.061) | (0.519) | (0.501) | (0.344) | (0.504) | (0.135) | (0.113) | (0.773) | (0.379) |
| $p5\_10_{i,t}$ | **-0.3293*** | **-0.4106**** | **-0.3325**** | **-0.3019** | **-0.1610** | **-0.4595*** | **-0.9399**** | **-0.1072** | **-0.5392** | **0.9993** |
| | (0.060) | (0.035) | (0.018) | (0.171) | (0.781) | (0.053) | (0.029) | (0.690) | (0.255) | (0.368) |
| $p10\_15_{i,t}$ | **-0.1216** | **-0.2687*** | **-0.2052** | **-0.0539** | **0.2020** | **-0.2531*** | **-0.3932*** | **-0.4638**** | **-0.0624** | **0.5464** |
| | (0.200) | (0.089) | (0.178) | (0.613) | (0.321) | (0.068) | (0.062) | (0.033) | (0.742) | (0.345) |
| $p15\_20_{i,t}$ | **-0.0340** | **-0.0863** | **-0.0719** | **-0.0273** | **0.0813** | **-0.0461** | **0.0806** | **-0.2552*** | **-0.0017** | **-0.2844** |
| | (0.601) | (0.135) | (0.400) | (0.720) | (0.397) | (0.586) | (0.463) | (0.069) | (0.991) | (0.745) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | | | | **0.0825** | **0.1298*** | **-0.2923** | **0.0531** | **-0.0113** |
| | | | | | | (0.261) | (0.087) | (0.160) | (0.672) | (0.877) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | | | | **0.0411*** | **0.1183** | **0.0389** | **0.0683** | **-0.1620** |
| | | | | | | (0.086) | (0.154) | (0.428) | (0.290) | (0.135) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | | | | **0.0191**** | **-0.0328** | **0.0801**** | **0.0042** | **-0.0285** |
| | | | | | | (0.037) | (0.314) | (0.019) | (0.769) | (0.469) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | | | | **0.0003** | **-0.0572** | **0.0424**** | **-0.0028** | **0.0230** |
| | | | | | | (0.952) | (0.162) | (0.040) | (0.752) | (0.637) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | | | | **-0.0028**** | **-0.0111***** | **0.0047*** | **-0.0033** | **-0.0016** |
| | | | | | | (0.029) | (0.000) | (0.056) | (0.113) | (0.871) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | | | | **0.0052** | **0.0399***** | **-0.0009** | **-0.0188**** | **0.0555**** |
| | | | | | | (0.173) | (0.004) | (0.951) | (0.012) | (0.028) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | | | | **-0.0038** | **-0.0004** | **-0.0170** | **-0.0152** | **-0.0304** |
| | | | | | | (0.417) | (0.982) | (0.186) | (0.154) | (0.244) |
| $R^2$ within | 0.0062 | 0.0084 | 0.0126 | 0.0163 | 0.0505 | 0.0093 | 0.0153 | 0.0241 | 0.0246 | 0.1796 |
| F-statistic | 2.2117 | 222.4513 | 2.0354 | 1.8082 | 6.9635 | 66.5454 | 239.0277 | 38.2582 | 3.9806 | 104.7953 |
| p-value | 0.0479 | 0.0000 | 0.0876 | 0.1056 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0006 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table I1.C. Results for the all-funds sample with $f(age_{i,t}) = age_{i,t}$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | | | | M2 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **0.0378** | **0.0189** | **-0.0161** | **-0.0905** | **0.1130** | **-0.0223** | **0.0652** | **-0.0705** | **-0.3633** | **-0.0346** |
| | (0.808) | (0.942) | (0.921) | (0.636) | (0.754) | (0.913) | (0.807) | (0.724) | (0.110) | (0.940) |
| $\boldsymbol{f(age_{i,t})}$ | **-0.0039** | **-0.0094** | **0.0189*** | **-0.0013** | **-0.0088** | **-0.0003** | **-0.0192** | **0.0226** | **0.0157**** | **-0.0099** |
| | (0.575) | (0.711) | (0.061) | (0.806) | (0.451) | (0.964) | (0.536) | (0.104) | (0.046) | (0.444) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.0534** | **-0.0994** | **0.0029** | **0.0531** | **0.1722** | **-0.0807** | **-0.2500*** | **0.0358** | **0.3482**** | **-0.2387** |
| | (0.362) | (0.252) | (0.978) | (0.526) | (0.141) | (0.245) | (0.062) | (0.835) | (0.017) | (0.277) |
| $\boldsymbol{Bull_{i,t}}$ | **-0.1556**** | **-0.1683** | **-0.1282** | **-0.0828** | **0.0351** | **-0.1422*** | **-0.1732** | **0.0121** | **0.1166** | **0.4722** |
| | (0.014) | (0.112) | (0.180) | (0.246) | (0.662) | (0.073) | (0.104) | (0.939) | (0.356) | (0.154) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0442*** | **0.0661** | **-0.0092** | **0.0237** | **0.0617**** | **0.0725*** | **0.0766** | **-0.0325** | **0.1078**** | **0.1617** |
| | (0.083) | (0.132) | (0.733) | (0.117) | (0.020) | (0.064) | (0.113) | (0.361) | (0.024) | (0.580) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0007** | **-0.0094** | **0.0069** | **0.0021** | **0.0054** | **-0.0005** | **-0.0123** | **0.0079*** | **0.0021** | **-0.0017** |
| | (0.840) | (0.247) | (0.150) | (0.622) | (0.646) | (0.871) | (0.147) | (0.079) | (0.613) | (0.908) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0160**** | **0.0228** | **0.0068** | **0.0245**** | **0.0086** | **0.0145**** | **0.0241** | **0.0068** | **0.0258**** | **0.0289** |
| | (0.043) | (0.153) | (0.358) | (0.021) | (0.653) | (0.049) | (0.133) | (0.403) | (0.016) | (0.186) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.0521** | **-0.4117** | **0.1655** | **0.2462** | **0.1723** | **0.0222** | **-0.7612** | **1.4845*** | **0.2657** | **0.2499** |
| | (0.802) | (0.207) | (0.556) | (0.200) | (0.442) | (0.942) | (0.128) | (0.051) | (0.481) | (0.573) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.1300** | **-0.1692** | **-0.1088** | **-0.1684** | **-0.2560** | **-0.1772** | **-0.4938** | **0.0944** | **-0.2873** | **-1.3335**** |
| | (0.357) | (0.447) | (0.357) | (0.260) | (0.342) | (0.330) | (0.148) | (0.689) | (0.334) | (0.017) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.0031** | **-0.2111** | **-0.0642** | **0.0505** | **0.1186** | **-0.0999** | **-0.3712**** | **-0.2446** | **0.1185** | **-0.1074** |
| | (0.973) | (0.178) | (0.671) | (0.547) | (0.396) | (0.443) | (0.019) | (0.254) | (0.370) | (0.776) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.0351** | **-0.0055** | **0.0011** | **0.0071** | **0.1176** | **0.0266** | **0.0802** | **-0.1396*** | **0.0927** | **-0.2194** |
| | (0.548) | (0.927) | (0.987) | (0.899) | (0.264) | (0.680) | (0.150) | (0.085) | (0.396) | (0.717) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | | | | | | **0.0415** | **0.0650*** | **-0.3191*** | **0.0419** | **-0.0385** |
| | | | | | | (0.386) | (0.094) | (0.089) | (0.617) | (0.630) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | | | | | | **0.0196** | **0.0255** | **0.0240** | **0.0445** | **0.1391**** |
| | | | | | | (0.368) | (0.724) | (0.550) | (0.310) | (0.033) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | | | | | | **0.0145** | **-0.0191** | **0.0582**** | **-0.0051** | **0.0166** |
| | | | | | | (0.156) | (0.545) | (0.035) | (0.671) | (0.533) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | | | | | | **0.0002** | **-0.0418*** | **0.0324**** | **-0.0083** | **0.0191** |
| | | | | | | (0.958) | (0.092) | (0.033) | (0.210) | (0.568) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | | | | | | **-0.0023**** | **-0.0015** | **0.0017** | **-0.0040**** | **-0.0029** |
| | | | | | | (0.041) | (0.456) | (0.442) | (0.044) | (0.747) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | | | | | | **0.0054** | **0.0437**** | **-0.0046** | **-0.0217***** | **0.0169*** |
| | | | | | | (0.245) | (0.038) | (0.733) | (0.005) | (0.086) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | | | | | | **-0.0006** | **-0.0007** | **-0.0178** | **-0.0154**** | **-0.0187** |
| | | | | | | (0.900) | (0.974) | (0.129) | (0.040) | (0.130) |
| $R^2$ within | 0.0223 | 0.0358 | 0.0200 | 0.0166 | 0.0649 | 0.0244 | 0.0398 | 0.0286 | 0.0258 | 0.1168 |
| F-statistic | 3.6566 | 3624.8435 | 3.8551 | 3.0085 | 14.9452 | 38.3135 | 492.6161 | 97.6977 | 4.0719 | 6.3188 |
| p-value | 0.0032 | 0.0000 | 0.0056 | 0.0104 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0005 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table I2.A. Results for the all-funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | Sharpe | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **-0.0177** | **0.1263** | **-0.0660** | **-0.1385** | **0.6412**** | **-0.0720** | **-0.1057** | **-0.2215** | **0.0059** | **1.1576**** |
| | (0.834) | (0.157) | (0.484) | (0.134) | (0.049) | (0.521) | (0.420) | (0.111) | (0.979) | (0.024) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0402** | **-0.0137** | **0.0516** | **0.0285** | **-0.1917**** | **0.0464** | **0.1353**** | **0.1500**** | **-0.0108** | **-0.3580**** |
| | (0.325) | (0.831) | (0.173) | (0.332) | (0.032) | (0.403) | (0.030) | (0.021) | (0.904) | (0.049) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.5338***** | **-0.5899***** | **-0.4469***** | **-0.4326***** | **-0.3516***** | **-0.5746***** | **-0.4724***** | **-0.1482** | **-0.4656**** | **-0.7091**** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.002) | (0.384) | (0.014) | (0.027) |
| $\boldsymbol{Bull_{i,t}}$ | **0.0641** | **0.0110** | **0.1368** | **0.1430**** | **0.2104**** | **0.1242*** | **0.2919**** | **0.5503***** | **0.4228*** | **0.6172** |
| | (0.375) | (0.883) | (0.103) | (0.038) | (0.033) | (0.085) | (0.042) | (0.000) | (0.056) | (0.186) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0129** | **0.0295**** | **-0.0015** | **0.0011** | **0.0460** | **0.0486**** | **0.0535*** | **-0.0917** | **-0.1459** | **-0.3575** |
| | (0.345) | (0.042) | (0.937) | (0.947) | (0.216) | (0.032) | (0.059) | (0.188) | (0.289) | (0.377) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0011** | **0.0012** | **0.0006** | **0.0012** | **0.0016** | **-0.0001** | **-0.0012** | **0.0021** | **0.0021** | **-0.0005** |
| | (0.632) | (0.839) | (0.795) | (0.518) | (0.641) | (0.974) | (0.855) | (0.150) | (0.174) | (0.939) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0006** | **-0.0049** | **-0.0007** | **0.0057** | **-0.0179** | **0.0004** | **-0.0027** | **-0.0009** | **0.0057** | **-0.0106** |
| | (0.818) | (0.395) | (0.740) | (0.249) | (0.153) | (0.882) | (0.642) | (0.647) | (0.241) | (0.400) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.1213** | **-0.2395** | **0.2100*** | **0.0873** | **-0.1503** | **-0.0435** | **-0.3903*** | **0.6302** | **-0.1294** | **-1.1932**** |
| | (0.224) | (0.212) | (0.083) | (0.223) | (0.438) | (0.737) | (0.062) | (0.314) | (0.625) | (0.027) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.1135** | **-0.1352** | **0.0901*** | **0.0697** | **-0.0802** | **0.0917** | **-0.2888*** | **0.0426** | **-0.1721** | **-0.7122** |
| | (0.166) | (0.382) | (0.093) | (0.345) | (0.511) | (0.538) | (0.070) | (0.715) | (0.529) | (0.347) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.0865** | **-0.1737**** | **0.0991** | **0.0806** | **-0.1068** | **0.0104** | **-0.0737** | **0.0181** | **-0.1694** | **-0.5928** |
| | (0.186) | (0.017) | (0.180) | (0.147) | (0.266) | (0.934) | (0.343) | (0.910) | (0.500) | (0.367) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.0770** | **-0.0072** | **0.0334** | **0.0432** | **0.0919** | **0.0376** | **0.1441** | **-0.0006** | **-0.0826** | **-1.0191**** |
| | (0.142) | (0.891) | (0.439) | (0.203) | (0.217) | (0.672) | (0.262) | (0.993) | (0.698) | (0.028) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | | | | | | **0.1296*** | **0.2184***** | **-0.3016** | **0.0798** | **0.5185***** |
| | | | | | | (0.074) | (0.003) | (0.482) | (0.536) | (0.008) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | | | | | | **0.0117** | **0.1256** | **0.0439** | **0.0922** | **0.2247** |
| | | | | | | (0.856) | (0.245) | (0.471) | (0.470) | (0.413) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | | | | | | **0.0343** | **-0.0735** | **0.0642** | **0.1006** | **0.1685** |
| | | | | | | (0.397) | (0.333) | (0.364) | (0.320) | (0.464) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | | | | | | **0.0153** | **-0.1139** | **0.0225** | **0.0424** | **0.3865***** |
| | | | | | | (0.582) | (0.268) | (0.525) | (0.597) | (0.008) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | | | | | | **-0.0124*** | **-0.0144**** | **0.0310** | **0.0465** | **0.1171** |
| | | | | | | (0.098) | (0.041) | (0.219) | (0.308) | (0.313) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | | | | | | **0.0272** | **-0.0759** | **-0.1508**** | **0.0125** | **0.1138** |
| | | | | | | (0.357) | (0.174) | (0.036) | (0.871) | (0.323) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | | | | | | **-0.0309** | **-0.1988**** | **-0.2047***** | **-0.1088** | **-0.1300** |
| | | | | | | (0.306) | (0.013) | (0.006) | (0.213) | (0.425) |
| $R^2$ within | 0.3967 | 0.4693 | 0.3751 | 0.2912 | 0.3526 | 0.3998 | 0.4793 | 0.4043 | 0.3027 | 0.3783 |
| F-statistic | 24.4388 | 17544.1757 | 18.8459 | 30.4101 | 9.8680 | 56.7350 | 858.3168 | 176.1749 | 24.4062 | 20.2289 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table I2.B. Results for the all-funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | $R_{Fund}$-$R_{PPB}$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **-0.1484** | **-0.1185** | **0.0464** | **-0.2593** | **0.4424** | **-0.2269** | **-0.1861** | **0.1354** | **-0.4906** | **0.4864** |
| | (0.351) | (0.610) | (0.825) | (0.439) | (0.676) | (0.239) | (0.293) | (0.655) | (0.297) | (0.665) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0479** | **-0.0046** | **0.0435** | **0.0253** | **-0.2362** | **0.0209** | **-0.0408** | **0.0157** | **0.1143** | **-0.3102** |
| | (0.216) | (0.930) | (0.451) | (0.783) | (0.458) | (0.705) | (0.710) | (0.880) | (0.405) | (0.316) |
| $\boldsymbol{Bear_{i,t}}$ | **0.0359** | **0.0042** | **0.1435** | **0.1283** | **-0.0813** | **-0.0829** | **-0.3011*** ** | **0.1619** | **0.7165*** ** | **-3.2637** ** |
| | (0.420) | (0.940) | (0.175) | (0.198) | (0.717) | (0.225) | (0.004) | (0.618) | (0.005) | (0.041) |
| $\boldsymbol{Bull_{i,t}}$ | **0.0464** | **0.0677** | **0.0624** | **0.0832** | **0.1273** | **0.1001** | **-0.0002** | **0.3665** | **0.5768** | **2.0019** |
| | (0.465) | (0.567) | (0.478) | (0.271) | (0.250) | (0.297) | (0.997) | (0.165) | (0.164) | (0.232) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0122** | **0.0451** | **-0.0238** | **0.0059** | **0.0420** | **0.1257*** ** | **0.1457*** ** | **-0.1990* ** | **0.2129* ** | **0.0721** |
| | (0.498) | (0.124) | (0.277) | (0.775) | (0.162) | (0.002) | (0.002) | (0.082) | (0.051) | (0.937) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0073** ** | **0.0075** ** | **0.0061** | **0.0053** | **0.0076** | **0.0034** | **-0.0037** | **0.0085* ** | **0.0044** | **-0.0059** |
| | (0.019) | (0.033) | (0.147) | (0.285) | (0.558) | (0.256) | (0.314) | (0.053) | (0.371) | (0.795) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0134*** ** | **0.0053** | **0.0045** | **0.0274** ** | **0.0316** ** | **0.0120*** ** | **0.0090** | **0.0034** | **0.0275*** ** | **0.0628** ** |
| | (0.002) | (0.261) | (0.236) | (0.013) | (0.045) | (0.003) | (0.115) | (0.382) | (0.009) | (0.045) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.2229** | **-0.2662** | **-0.1403** | **0.3448** | **0.1055** | **-0.1442** | **-0.4916** | **1.7303** | **0.0577** | **0.0370** |
| | (0.257) | (0.287) | (0.609) | (0.115) | (0.840) | (0.701) | (0.263) | (0.134) | (0.937) | (0.977) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.0740** | **-0.1612** | **-0.3255* ** | **-0.1694** | **-0.2432** | **-0.5131** | **-0.8290* ** | **-0.1572** | **-0.8554** | **1.5276** |
| | (0.682) | (0.353) | (0.056) | (0.306) | (0.578) | (0.106) | (0.068) | (0.737) | (0.186) | (0.457) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.0493** | **-0.1094** | **-0.1947** | **0.0363** | **0.1631** | **-0.3152* ** | **-0.1189** | **-0.8124** ** | **-0.2373** | **0.1553** |
| | (0.573) | (0.235) | (0.234) | (0.740) | (0.552) | (0.089) | (0.623) | (0.010) | (0.491) | (0.899) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.0660** | **0.0206** | **-0.0657** | **0.0290** | **0.0664** | **-0.0177** | **0.1559** | **-0.5151** ** | **-0.0432** | **-1.5075** |
| | (0.384) | (0.815) | (0.497) | (0.675) | (0.535) | (0.893) | (0.547) | (0.026) | (0.886) | (0.414) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | | | | | | **0.2961** | **0.3872* ** | **-1.1141** | **0.2236** | **0.1042** |
| | | | | | | (0.141) | (0.092) | (0.156) | (0.583) | (0.869) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | | | | | | **0.2669** ** | **0.4904* ** | **0.1120** | **0.4039** | **-0.8869** |
| | | | | | | (0.020) | (0.070) | (0.640) | (0.166) | (0.293) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | | | | | | **0.1632** ** | **-0.0872** | **0.4788*** ** | **0.0989** | **0.0048** |
| | | | | | | (0.013) | (0.492) | (0.004) | (0.445) | (0.991) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | | | | | | **0.0221** | **-0.1198** | **0.2911** ** | **0.0024** | **0.5632** |
| | | | | | | (0.593) | (0.564) | (0.012) | (0.982) | (0.373) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | | | | | | **-0.0392*** ** | **-0.0430* ** | **0.0640* ** | **-0.0645* ** | **-0.0107** |
| | | | | | | (0.002) | (0.051) | (0.084) | (0.060) | (0.967) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | | | | | | **0.0766** ** | **0.2269*** ** | **-0.0144** | **-0.2336** ** | **1.0302** ** |
| | | | | | | (0.033) | (0.002) | (0.906) | (0.010) | (0.030) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | | | | | | **-0.0271** | **0.0369** | **-0.1490** | **-0.1979** | **-0.5957** |
| | | | | | | (0.397) | (0.687) | (0.154) | (0.187) | (0.246) |
| $R^2$ within | 0.0054 | 0.0070 | 0.0128 | 0.0159 | 0.0514 | 0.0103 | 0.0139 | 0.0286 | 0.0273 | 0.1945 |
| F-statistic | 1.8779 | 199.0063 | 3.0194 | 1.5157 | 5.3819 | 48.2014 | 1.3174 | 371.1363 | 4.8691 | 76.7434 |
| p-value | 0.0921 | 0.0000 | 0.0184 | 0.1858 | 0.0002 | 0.0000 | 0.3461 | 0.0000 | 0.0001 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table I2.C. Results for the all-funds sample with $f(age_{i,t}) = ln(age_{i,t} + 1)$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | | | | M2 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **-0.0712** | **0.0278** | **-0.1644** | **-0.1822** | **-0.1635** | **-0.0962** | **0.0832** | **-0.1644** | **-0.7330*** | **0.6528** |
| | (0.733) | (0.920) | (0.390) | (0.481) | (0.850) | (0.709) | (0.749) | (0.555) | (0.061) | (0.487) |
| $f(age_{i,t})$ | **0.0701** | **-0.0190** | **0.1511**** | **0.0252** | **0.0205** | **0.0483** | **-0.0560** | **0.1645** | **0.2267**** | **-0.2927** |
| | (0.144) | (0.827) | (0.020) | (0.677) | (0.932) | (0.483) | (0.692) | (0.111) | (0.049) | (0.259) |
| $Bear_{i,t}$ | **-0.0539** | **-0.1003** | **-0.0039** | **0.0528** | **0.1693** | **-0.1725*** | **-0.3987**** | **0.0926** | **0.7418**** | **-0.6821** |
| | (0.334) | (0.240) | (0.970) | (0.531) | (0.145) | (0.089) | (0.038) | (0.750) | (0.012) | (0.162) |
| $Bull_{i,t}$ | **-0.1536**** | **-0.1676** | **-0.1356** | **-0.0833** | **0.0322** | **-0.1397** | **-0.1504** | **0.1259** | **0.3880** | **1.0491** |
| | (0.018) | (0.119) | (0.153) | (0.243) | (0.687) | (0.173) | (0.333) | (0.607) | (0.155) | (0.194) |
| $Size_{i,t-1}$ | **0.0281** | **0.0613*** | **-0.0077** | **0.0201** | **0.0424*** | **0.0886**** | **0.0841*** | **-0.1182** | **0.2900***** | **0.4069** |
| | (0.173) | (0.082) | (0.771) | (0.262) | (0.080) | (0.019) | (0.052) | (0.206) | (0.010) | (0.621) |
| $Share_{i,t-1}$ | **0.0017** | **-0.0087** | **0.0063** | **0.0024** | **0.0086** | **-0.0005** | **-0.0127*** | **0.0079*** | **0.0017** | **-0.0038** |
| | (0.627) | (0.249) | (0.171) | (0.574) | (0.424) | (0.886) | (0.052) | (0.086) | (0.662) | (0.815) |
| $ABIshare_{i,t-1}$ | **0.0150*** | **0.0226** | **0.0058** | **0.0246**** | **0.0088** | **0.0142*** | **0.0243** | **0.0047** | **0.0252**** | **0.0305** |
| | (0.055) | (0.142) | (0.438) | (0.020) | (0.641) | (0.068) | (0.113) | (0.564) | (0.015) | (0.188) |
| $p0\_5_{i,t}$ | **0.2615** | **-0.3576** | **0.1983** | **0.3247*** | **0.3379** | **0.1220** | **-0.7215*** | **2.2094**** | **0.3907** | **-0.1855** |
| | (0.194) | (0.168) | (0.499) | (0.057) | (0.368) | (0.716) | (0.058) | (0.050) | (0.438) | (0.851) |
| $p5\_10_{i,t}$ | **0.0192** | **-0.1236** | **-0.0963** | **-0.1114** | **-0.1180** | **-0.1621** | **-0.4430** | **0.2353** | **-0.4097** | **-3.3108**** |
| | (0.888) | (0.506) | (0.431) | (0.322) | (0.625) | (0.546) | (0.271) | (0.562) | (0.336) | (0.013) |
| $p10\_15_{i,t}$ | **0.0901** | **-0.1820*** | **-0.0349** | **0.0878** | **0.2203** | **-0.1240** | **-0.2622** | **-0.4134** | **0.1631** | **-0.9560** |
| | (0.357) | (0.084) | (0.809) | (0.330) | (0.203) | (0.578) | (0.160) | (0.149) | (0.556) | (0.244) |
| $p15\_20_{i,t}$ | **0.0896** | **0.0123** | **0.0192** | **0.0298** | **0.1813*** | **0.0727** | **0.2033** | **-0.2610**** | **0.2217** | **-1.3236** |
| | (0.204) | (0.823) | (0.787) | (0.557) | (0.078) | (0.437) | (0.112) | (0.043) | (0.352) | (0.289) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | | | | **0.1088** | **0.1957** | **-1.3157*** | **0.0648** | **-0.0123** |
| | | | | | | (0.423) | (0.114) | (0.068) | (0.811) | (0.980) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | | | | **0.1073** | **0.0968** | **-0.0505** | **0.2345** | **1.3390**** |
| | | | | | | (0.337) | (0.693) | (0.809) | (0.254) | (0.023) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | | | | **0.0971** | **-0.0775** | **0.2998*** | **-0.0411** | **0.3799** |
| | | | | | | (0.225) | (0.518) | (0.050) | (0.722) | (0.196) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | | | | **-0.0025** | **-0.1830*** | **0.1835**** | **-0.0952** | **0.4915** |
| | | | | | | (0.928) | (0.079) | (0.020) | (0.262) | (0.244) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | | | | **-0.0212**** | **-0.0111** | **0.0397** | **-0.0860**** | **-0.0952** |
| | | | | | | (0.039) | (0.599) | (0.204) | (0.014) | (0.681) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | | | | **0.0724** | **0.2199**** | **-0.0514** | **-0.2747**** | **0.2717** |
| | | | | | | (0.122) | (0.031) | (0.685) | (0.011) | (0.107) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | | | | **-0.0064** | **-0.0182** | **-0.1289** | **-0.1908*** | **-0.3245** |
| | | | | | | (0.879) | (0.862) | (0.163) | (0.068) | (0.190) |
| $R^2$ within | 0.0229 | 0.0357 | 0.0222 | 0.0167 | 0.0633 | 0.0252 | 0.0412 | 0.0330 | 0.0295 | 0.1167 |
| F-statistic | 4.2511 | 3027.6704 | 12.6030 | 2.9857 | 12.5562 | 22.2882 | 168.7397 | 93.4078 | 5.2733 | 8.1413 |
| p-value | 0.0012 | 0.0000 | 0.0000 | 0.0109 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table I3.A. Results for the all-funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | | | | Sharpe | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **-0.0373** | **0.1415** | **-0.1134** | **-0.1494** | **0.7134**** | **-0.0871** | **-0.2164** | **-0.3426*** | **-0.0250** | **1.0697**** |
| | (0.736) | (0.277) | (0.334) | (0.224) | (0.033) | (0.533) | (0.217) | (0.063) | (0.920) | (0.030) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0501** | **-0.0261** | **0.0807** | **0.0363** | **-0.2414**** | **0.0514** | **0.1964**** | **0.2221**** | **0.0025** | **-0.3687*** |
| | (0.429) | (0.790) | (0.173) | (0.459) | (0.029) | (0.518) | (0.034) | (0.022) | (0.982) | (0.062) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.5341***** | **-0.5899***** | **-0.4470***** | **-0.4327***** | **-0.3514***** | **-0.5972***** | **-0.4165**** | **-0.0559** | **-0.4518**** | **-0.7119**** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.021) | (0.792) | (0.049) | (0.042) |
| $\boldsymbol{Bull_{i,t}}$ | **0.0635** | **0.0109** | **0.1369** | **0.1430**** | **0.2107**** | **0.1408*** | **0.4489**** | **0.6990***** | **0.5080*** | **0.7165** |
| | (0.381) | (0.884) | (0.103) | (0.038) | (0.033) | (0.077) | (0.028) | (0.000) | (0.057) | (0.154) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0137** | **0.0303**** | **-0.0027** | **0.0009** | **0.0501** | **0.0624**** | **0.0736**** | **-0.1069** | **-0.1688** | **-0.3858** |
| | (0.305) | (0.038) | (0.879) | (0.957) | (0.160) | (0.034) | (0.043) | (0.150) | (0.234) | (0.277) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0011** | **0.0011** | **0.0007** | **0.0012** | **0.0010** | **-0.0002** | **-0.0018** | **0.0023** | **0.0023** | **-0.0005** |
| | (0.621) | (0.847) | (0.769) | (0.494) | (0.778) | (0.916) | (0.787) | (0.125) | (0.141) | (0.938) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0008** | **-0.0048** | **-0.0007** | **0.0058** | **-0.0172** | **0.0004** | **-0.0023** | **-0.0008** | **0.0058** | **-0.0095** |
| | (0.770) | (0.405) | (0.746) | (0.247) | (0.167) | (0.875) | (0.691) | (0.695) | (0.231) | (0.448) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.1152** | **-0.2474** | **0.2231*** | **0.0838** | **-0.1447** | **-0.1839** | **-0.5909**** | **0.9128** | **-0.1574** | **-1.2511**** |
| | (0.279) | (0.202) | (0.068) | (0.311) | (0.482) | (0.314) | (0.015) | (0.357) | (0.635) | (0.020) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.1106** | **-0.1413** | **0.1005*** | **0.0675** | **-0.0906** | **0.0511** | **-0.4076*** | **0.0099** | **-0.2235** | **-0.6461** |
| | (0.201) | (0.367) | (0.063) | (0.401) | (0.510) | (0.788) | (0.052) | (0.953) | (0.499) | (0.434) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.0862** | **-0.1776**** | **0.1047** | **0.0799** | **-0.1186** | **-0.0416** | **-0.0195** | **-0.0420** | **-0.2285** | **-0.4680** |
| | (0.205) | (0.017) | (0.163) | (0.169) | (0.242) | (0.784) | (0.861) | (0.839) | (0.414) | (0.504) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.0768** | **-0.0099** | **0.0358** | **0.0430** | **0.0828** | **0.0135** | **0.2387** | **-0.0406** | **-0.0930** | **-0.9713**** |
| | (0.157) | (0.848) | (0.425) | (0.219) | (0.294) | (0.893) | (0.257) | (0.664) | (0.682) | (0.030) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | | | | | | **0.2128*** | **0.3363***** | **-0.4663** | **0.1042** | **0.6054**** |
| | | | | | | (0.060) | (0.003) | (0.484) | (0.561) | (0.011) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | | | | | | **0.0307** | **0.1921** | **0.0783** | **0.1282** | **0.2268** |
| | | | | | | (0.737) | (0.247) | (0.396) | (0.451) | (0.510) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | | | | | | **0.0603** | **-0.1145** | **0.1084** | **0.1392** | **0.1394** |
| | | | | | | (0.281) | (0.329) | (0.277) | (0.264) | (0.616) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | | | | | | **0.0259** | **-0.1777** | **0.0487** | **0.0513** | **0.4151***** |
| | | | | | | (0.480) | (0.268) | (0.337) | (0.588) | (0.010) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | | | | | | **-0.0191*** | **-0.0251**** | **0.0406** | **0.0598** | **0.1382** |
| | | | | | | (0.066) | (0.031) | (0.174) | (0.252) | (0.219) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | | | | | | **0.0411** | **-0.1112** | **-0.2090**** | **0.0077** | **0.1264** |
| | | | | | | (0.311) | (0.179) | (0.036) | (0.940) | (0.361) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | | | | | | **-0.0409** | **-0.2992**** | **-0.2958***** | **-0.1564** | **-0.1796** |
| | | | | | | (0.303) | (0.015) | (0.004) | (0.175) | (0.352) |
| $R^2$ within | 0.3964 | 0.4694 | 0.3753 | 0.2911 | 0.3533 | 0.4000 | 0.4793 | 0.4063 | 0.3050 | 0.3832 |
| F-statistic | 26.2836 | 19559.0656 | 19.5254 | 30.3310 | 9.9736 | 60.8411 | 835.0862 | 233.5815 | 23.9402 | 18.3469 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table I3.B. Results for the all-funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | $R_{Fund}$-$R_{PPB}$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **-0.1547** | **-0.1112** | **0.0194** | **-0.2086** | **0.4748** | **-0.1962** | **-0.1592** | **0.0986** | **-0.5264** | **0.3811** |
| | (0.391) | (0.664) | (0.937) | (0.578) | (0.641) | (0.386) | (0.484) | (0.780) | (0.300) | (0.730) |
| $f(age_{i,t})$ | **0.0476** | **-0.0116** | **0.0604** | **0.0080** | **-0.2783** | **0.0025** | **-0.0671** | **0.0311** | **0.1408** | **-0.3078** |
| | (0.417) | (0.886) | (0.473) | (0.947) | (0.419) | (0.975) | (0.685) | (0.828) | (0.399) | (0.360) |
| $Bear_{i,t}$ | **0.0355** | **0.0042** | **0.1438** | **0.1284** | **-0.0813** | **-0.1164** | **-0.4768*** ** | **0.1684** | **0.8080*** ** | **-3.3341** ** |
| | (0.425) | (0.940) | (0.174) | (0.196) | (0.717) | (0.168) | (0.003) | (0.669) | (0.006) | (0.037) |
| $Bull_{i,t}$ | **0.0455** | **0.0677** | **0.0628** | **0.0835** | **0.1272** | **0.1250** | **-0.0235** | **0.4611** | **0.6462** | **2.0057** |
| | (0.472) | (0.567) | (0.476) | (0.268) | (0.251) | (0.283) | (0.847) | (0.157) | (0.160) | (0.227) |
| $Size_{i,t-1}$ | **0.0146** | **0.0458** | **-0.0239** | **0.0073** | **0.0455** | **0.1477*** ** | **0.1875*** ** | **-0.2219* ** | **0.2137* ** | **0.0632** |
| | (0.417) | (0.123) | (0.269) | (0.718) | (0.142) | (0.004) | (0.003) | (0.064) | (0.059) | (0.939) |
| $Share_{i,t-1}$ | **0.0072** ** | **0.0074** ** | **0.0061** | **0.0051** | **0.0072** | **0.0034** | **-0.0041** | **0.0085** ** | **0.0044** | **-0.0043** |
| | (0.020) | (0.034) | (0.143) | (0.300) | (0.596) | (0.244) | (0.279) | (0.046) | (0.371) | (0.844) |
| $ABIshare_{i,t-1}$ | **0.0137*** ** | **0.0054** | **0.0046** | **0.0274** ** | **0.0326** ** | **0.0120*** ** | **0.0093** | **0.0037** | **0.0276*** ** | **0.0614** ** |
| | (0.002) | (0.257) | (0.234) | (0.014) | (0.037) | (0.003) | (0.109) | (0.354) | (0.009) | (0.044) |
| $p0\_5_{i,t}$ | **0.1976** | **-0.2729** | **-0.1413** | **0.3035** | **0.1341** | **-0.4961** | **-0.8583** | **2.7612** | **-0.1486** | **0.2174** |
| | (0.313) | (0.277) | (0.606) | (0.173) | (0.770) | (0.359) | (0.149) | (0.135) | (0.889) | (0.883) |
| $p5\_10_{i,t}$ | **-0.0902** | **-0.1663** | **-0.3253* ** | **-0.1989** | **-0.2405** | **-0.7834** ** | **-1.2697* ** | **-0.2588** | **-1.1630** | **2.4007** |
| | (0.612) | (0.338) | (0.056) | (0.253) | (0.603) | (0.046) | (0.052) | (0.691) | (0.182) | (0.334) |
| $p10\_15_{i,t}$ | **0.0412** | **-0.1126** | **-0.1958** | **0.0177** | **0.1591** | **-0.4689** ** | **-0.0559** | **-1.1848*** ** | **-0.2543** | **0.4078** |
| | (0.641) | (0.227) | (0.234) | (0.872) | (0.540) | (0.043) | (0.840) | (0.007) | (0.524) | (0.764) |
| $p15\_20_{i,t}$ | **0.0612** | **0.0182** | **-0.0666** | **0.0180** | **0.0614** | **-0.0542** | **0.2557** | **-0.7446** ** | **-0.0192** | **-1.3812** |
| | (0.421) | (0.833) | (0.492) | (0.799) | (0.550) | (0.721) | (0.553) | (0.019) | (0.954) | (0.492) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | | | | **0.5011** | **0.6132* ** | **-1.7484** | **0.3548** | **0.0395** |
| | | | | | | (0.116) | (0.082) | (0.155) | (0.576) | (0.960) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | | | | **0.4173** ** | **0.7604* ** | **0.1982** | **0.5994** | **-1.3904** |
| | | | | | | (0.014) | (0.069) | (0.584) | (0.172) | (0.230) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | | | | **0.2436** ** | **-0.1376** | **0.7194*** ** | **0.1170** | **-0.0994** |
| | | | | | | (0.011) | (0.478) | (0.004) | (0.488) | (0.859) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | | | | **0.0347** | **-0.1879** | **0.4370** ** | **-0.0074** | **0.5822** |
| | | | | | | (0.540) | (0.560) | (0.012) | (0.955) | (0.450) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | | | | **-0.0519*** ** | **-0.0675** ** | **0.0812* ** | **-0.0723* ** | **-0.0091** |
| | | | | | | (0.004) | (0.043) | (0.065) | (0.072) | (0.971) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | | | | **0.0980** ** | **0.3385*** ** | **-0.0182** | **-0.2967*** ** | **1.1646** ** |
| | | | | | | (0.043) | (0.002) | (0.913) | (0.009) | (0.027) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | | | | **-0.0406** | **0.0513** | **-0.2080** | **-0.2483** | **-0.6630** |
| | | | | | | (0.373) | (0.712) | (0.153) | (0.177) | (0.240) |
| $R^2$ within | 0.0053 | 0.0070 | 0.0128 | 0.0158 | 0.0514 | 0.0102 | 0.0140 | 0.0286 | 0.0270 | 0.1924 |
| F-statistic | 1.8383 | 198.4431 | 2.8897 | 1.5289 | 5.6084 | 57.1964 | 608.2924 | 476.7415 | 4.6164 | 63.7747 |
| p-value | 0.0995 | 0.0000 | 0.0224 | 0.1812 | 0.0001 | 0.0000 | 0.0000 | 0.0000 | 0.0002 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

Table I3.C. Results for the all-funds sample with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$ sorted by the fund's foundation decade. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Dependent | | | | | M2 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Decade | All | 2000s | 1990s | 1980s | 1970s | All | 2000s | 1990s | 1980s | 1970s |
| ***Constant*** | **-0.1071** | **0.0453** | **-0.2815** | **-0.1755** | **0.0325** | **-0.1152** | **0.1275** | **-0.3046** | **-0.7913*** | **0.5392** |
| | (0.644) | (0.885) | (0.214) | (0.535) | (0.971) | (0.697) | (0.704) | (0.350) | (0.056) | (0.558) |
| $f(age_{i,t})$ | **0.0886** | **-0.0314** | **0.2236**** | **0.0255** | **-0.0434** | **0.0530** | **-0.0900** | **0.2454*** | **0.2763**** | **-0.2856** |
| | (0.204) | (0.816) | (0.021) | (0.746) | (0.876) | (0.575) | (0.674) | (0.086) | (0.043) | (0.310) |
| $Bear_{i,t}$ | **-0.0544** | **-0.1003** | **-0.0035** | **0.0527** | **0.1703** | **-0.2043** | **-0.5678**** | **0.1152** | **0.8450**** | **-0.7367** |
| | (0.331) | (0.241) | (0.973) | (0.530) | (0.143) | (0.101) | (0.035) | (0.748) | (0.011) | (0.146) |
| $Bull_{i,t}$ | **-0.1547**** | **-0.1677** | **-0.1347** | **-0.0832** | **0.0335** | **-0.1343** | **-0.1327** | **0.2146** | **0.4637** | **1.0864** |
| | (0.017) | (0.119) | (0.156) | (0.243) | (0.676) | (0.273) | (0.553) | (0.472) | (0.127) | (0.172) |
| $Size_{i,t-1}$ | **0.0293** | **0.0617*** | **-0.0099** | **0.0203** | **0.0473*** | **0.1106**** | **0.0967** | **-0.1314** | **0.2793**** | **0.3237** |
| | (0.162) | (0.083) | (0.714) | (0.244) | (0.065) | (0.022) | (0.101) | (0.174) | (0.016) | (0.664) |
| $Share_{i,t-1}$ | **0.0017** | **-0.0087** | **0.0064** | **0.0024** | **0.0077** | **-0.0007** | **-0.0130*** | **0.0081*** | **0.0019** | **-0.0029** |
| | (0.626) | (0.247) | (0.163) | (0.579) | (0.490) | (0.843) | (0.051) | (0.077) | (0.641) | (0.852) |
| $ABIshare_{i,t-1}$ | **0.0153*** | **0.0226** | **0.0059** | **0.0247**** | **0.0082** | **0.0142*** | **0.0245** | **0.0049** | **0.0253**** | **0.0303** |
| | (0.053) | (0.141) | (0.431) | (0.021) | (0.665) | (0.067) | (0.110) | (0.547) | (0.015) | (0.183) |
| $p0\_5_{i,t}$ | **0.2527** | **-0.3618** | **0.2164** | **0.3113*** | **0.2593** | **-0.0221** | **-0.8993**** | **3.3929*** | **0.2624** | **0.1720** |
| | (0.214) | (0.170) | (0.461) | (0.073) | (0.451) | (0.960) | (0.049) | (0.053) | (0.717) | (0.885) |
| $p5\_10_{i,t}$ | **0.0154** | **-0.1270** | **-0.0804** | **-0.1208** | **-0.1730** | **-0.2904** | **-0.5256** | **0.2468** | **-0.6403** | **-3.7713**** |
| | (0.911) | (0.501) | (0.503) | (0.307) | (0.485) | (0.395) | (0.364) | (0.657) | (0.263) | (0.016) |
| $p10\_15_{i,t}$ | **0.0904** | **-0.1842*** | **-0.0283** | **0.0823** | **0.1835** | **-0.2263** | **-0.2103** | **-0.6608*** | **0.1896** | **-0.8851** |
| | (0.360) | (0.086) | (0.845) | (0.356) | (0.286) | (0.394) | (0.388) | (0.090) | (0.548) | (0.320) |
| $p15\_20_{i,t}$ | **0.0898** | **0.0108** | **0.0213** | **0.0267** | **0.1600** | **0.0532** | **0.3383** | **-0.4245**** | **0.2657** | **-1.1889** |
| | (0.204) | (0.841) | (0.762) | (0.606) | (0.125) | (0.600) | (0.106) | (0.022) | (0.299) | (0.383) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | | | | | | **0.1924** | **0.3026** | **-2.0413*** | **0.1382** | **-0.1697** |
| | | | | | | (0.359) | (0.110) | (0.070) | (0.745) | (0.798) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | | | | | | **0.1786** | **0.1438** | **-0.0308** | **0.3746** | **1.7270**** |
| | | | | | | (0.277) | (0.702) | (0.922) | (0.218) | (0.027) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | | | | | | **0.1524** | **-0.1133** | **0.4656**** | **-0.0566** | **0.4056** |
| | | | | | | (0.169) | (0.537) | (0.040) | (0.699) | (0.265) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | | | | | | **0.0033** | **-0.2693*** | **0.2884**** | **-0.1238** | **0.5009** |
| | | | | | | (0.930) | (0.097) | (0.015) | (0.224) | (0.334) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | | | | | | **-0.0321**** | **-0.0179** | **0.0494** | **-0.0925**** | **-0.0790** |
| | | | | | | (0.026) | (0.580) | (0.181) | (0.022) | (0.733) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | | | | | | **0.0926** | **0.3271**** | **-0.0662** | **-0.3469***** | **0.3200*** |
| | | | | | | (0.142) | (0.033) | (0.699) | (0.009) | (0.097) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | | | | | | **-0.0091** | **-0.0298** | **-0.1833** | **-0.2430*** | **-0.3735** |
| | | | | | | (0.873) | (0.851) | (0.153) | (0.058) | (0.166) |
| $R^2$ within | 0.0227 | 0.0357 | 0.0221 | 0.0166 | 0.0633 | 0.0251 | 0.0411 | 0.0331 | 0.0290 | 0.1174 |
| F-statistic | 4.6241 | 3043.3850 | 12.5500 | 2.9815 | 13.2553 | 29.1649 | 95.0213 | 118.0080 | 5.0568 | 7.7580 |
| p-value | 0.0006 | 0.0000 | 0.0000 | 0.0110 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0000 |
| Funds | 4897 | 4207 | 326 | 326 | 38 | 4897 | 4207 | 326 | 326 | 38 |
| Observations | 27978 | 17007 | 4159 | 6250 | 562 | 27978 | 17007 | 4159 | 6250 | 562 |

## J. Regression results for the quarterly sample (Chapter 3)

Table J.A. Results for the all-funds sample. The PPB is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[2]{age_{i,t}}$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.0935** | **0.1689** | **0.5469** | **0.2238** | **0.1929** | **0.7149** | **-0.0088** | **0.2033** | **0.6242** | **-0.1335** | **0.2338** | **0.6589** |
| | (0.722) | (0.649) | (0.189) | (0.408) | (0.604) | (0.111) | (0.976) | (0.579) | (0.142) | (0.711) | (0.533) | (0.146) |
| $f(age_{i,t})$ | **0.0555** | **-0.0118** | **-0.0091** | **0.2941** | **-0.0291** | **0.0224** | **0.3048** | **-0.0418** | **0.0159** | **0.4991** | **-0.0544** | **0.0361** |
| | (0.187) | (0.419) | (0.698) | (0.169) | (0.648) | (0.842) | (0.160) | (0.483) | (0.881) | (0.164) | (0.581) | (0.840) |
| $Bear_{i,t}$ | **-0.6983*** ** | **0.2867** ** | **-0.4725** ** | **-0.7914*** ** | **0.2962** ** | **-0.4957*** | **-0.7858*** ** | **0.2951** ** | **-0.5091*** | **-0.8669*** ** | **0.3022*** | **-0.5385*** |
| | (0.001) | (0.012) | (0.044) | (0.001) | (0.046) | (0.061) | (0.001) | (0.034) | (0.053) | (0.000) | (0.074) | (0.064) |
| $Bull_{i,t}$ | **1.2694*** ** | **-0.0460** | **0.0320** | **1.3301*** ** | **0.0083** | **0.1000** | **1.3039*** ** | **-0.0047** | **0.0689** | **1.3447*** ** | **0.0365** | **0.1099** |
| | (0.000) | (0.663) | (0.814) | (0.000) | (0.946) | (0.544) | (0.000) | (0.968) | (0.664) | (0.000) | (0.783) | (0.559) |
| $Size_{i,t-1}$ | **0.1018** | **-0.0055** | **0.0205** | **-0.1512*** | **0.0034** | **-0.0988** | **-0.0352** | **0.0065** | **-0.0336** | **-0.1327** | **-0.0000** | **-0.0891** |
| | (0.303) | (0.847) | (0.797) | (0.099) | (0.940) | (0.365) | (0.574) | (0.862) | (0.722) | (0.145) | (0.999) | (0.456) |
| $Share_{i,t-1}$ | **-0.0021** | **0.0008** | **-0.0092** | **0.0042** | **0.0008** | **-0.0055** | **0.0018** | **0.0006** | **-0.0073** | **0.0030** | **0.0009** | **-0.0063** |
| | (0.701) | (0.847) | (0.346) | (0.286) | (0.847) | (0.534) | (0.665) | (0.889) | (0.434) | (0.452) | (0.832) | (0.485) |
| $ABIshare_{i,t-1}$ | **0.0075** | **0.0106** ** | **0.0224** ** | **0.0050** | **0.0110** ** | **0.0223** ** | **0.0064** | **0.0109** ** | **0.0228** ** | **0.0056** | **0.0110** ** | **0.0226** ** |
| | (0.256) | (0.037) | (0.046) | (0.405) | (0.031) | (0.044) | (0.310) | (0.032) | (0.043) | (0.358) | (0.031) | (0.043) |
| $p0\_5_{i,t}$ | **0.0483** | **-0.2351** | **-0.2832** | **-0.2448** | **-0.2581** | **-0.3149** | **-0.0413** | **-0.3559** | **-0.3604** | **-0.3127** | **-0.4697** | **-0.5673** |
| | (0.871) | (0.278) | (0.389) | (0.428) | (0.344) | (0.355) | (0.913) | (0.240) | (0.372) | (0.486) | (0.230) | (0.236) |
| $p5\_10_{i,t}$ | **0.3606** | **-0.3967** ** | **-0.1204** | **0.4516** | **-0.4938** ** | **-0.0760** | **0.6105** | **-0.5324** ** | **-0.0585** | **0.6574** | **-0.6512** ** | **-0.1096** |
| | (0.330) | (0.011) | (0.617) | (0.339) | (0.021) | (0.808) | (0.293) | (0.012) | (0.857) | (0.330) | (0.014) | (0.782) |
| $p10\_15_{i,t}$ | **0.2351** | **-0.1579** | **-0.1337** | **0.3628** | **-0.1712** | **-0.0928** | **0.4430** | **-0.2080** | **-0.1230** | **0.4674** | **-0.2341** | **-0.1835** |
| | (0.432) | (0.214) | (0.540) | (0.392) | (0.259) | (0.734) | (0.364) | (0.188) | (0.668) | (0.416) | (0.209) | (0.593) |
| $p15\_20_{i,t}$ | **0.2185** | **-0.0350** | **0.0378** | **0.3476** | **-0.0186** | **0.1459** | **0.3828** | **-0.0323** | **0.1247** | **0.4285** | **-0.0197** | **0.1613** |
| | (0.361) | (0.658) | (0.799) | (0.282) | (0.851) | (0.463) | (0.288) | (0.738) | (0.546) | (0.294) | (0.865) | (0.525) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.1190** | **0.0553** | **0.0909** | **0.2596** | **0.2206** | **0.3026** | **0.2241** | **0.2057** | **0.2769** | **0.3642** | **0.3510** | **0.4774*** |
| | (0.139) | (0.293) | (0.118) | (0.212) | (0.184) | (0.106) | (0.235) | (0.182) | (0.114) | (0.232) | (0.167) | (0.095) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0007** | **0.0217** | **-0.0095** | **-0.1891** | **0.1747** ** | **0.0017** | **-0.1398** | **0.1372** ** | **-0.0041** | **-0.2727** | **0.2683** ** | **0.0282** |
| | (0.980) | (0.176) | (0.704) | (0.379) | (0.038) | (0.990) | (0.417) | (0.036) | (0.968) | (0.394) | (0.027) | (0.881) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0113** | **0.0095** | **0.0246*** | **-0.0992** | **0.0690** | **0.1013** | **-0.0595** | **0.0574** | **0.0916** | **-0.1330** | **0.1036** | **0.1596** |
| | (0.477) | (0.250) | (0.097) | (0.553) | (0.196) | (0.324) | (0.637) | (0.164) | (0.238) | (0.585) | (0.183) | (0.281) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0005** | **-0.0031** | **-0.0029** | **-0.0968** | **-0.0070** | **-0.0467** | **-0.0618** | **-0.0055** | **-0.0264** | **-0.1304** | **-0.0088** | **-0.0560** |
| | (0.956) | (0.443) | (0.779) | (0.319) | (0.835) | (0.558) | (0.390) | (0.811) | (0.650) | (0.348) | (0.849) | (0.622) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0028** | **0.0002** | **-0.0001** | **0.0741*** | **-0.0036** | **0.0374** | **0.0216** | **-0.0027** | **0.0110** | **0.0748** | **-0.0024** | **0.0388** |
| | (0.285) | (0.854) | (0.980) | (0.094) | (0.766) | (0.252) | (0.135) | (0.686) | (0.481) | (0.102) | (0.871) | (0.321) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0156*** ** | **-0.0009** | **0.0106** | **0.1175** ** | **-0.0094** | **0.0542** | **0.0836** ** | **-0.0064** | **0.0461** | **0.1632** ** | **-0.0130** | **0.0802** |
| | (0.007) | (0.849) | (0.130) | (0.016) | (0.842) | (0.356) | (0.011) | (0.835) | (0.246) | (0.012) | (0.838) | (0.311) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0021** | **-0.0046** | **-0.0001** | **-0.0400** | **-0.0499*** | **-0.0384** | **-0.0200** | **-0.0314*** | **-0.0159** | **-0.0500** | **-0.0670*** | **-0.0452** |
| | (0.677) | (0.111) | (0.988) | (0.317) | (0.090) | (0.484) | (0.460) | (0.093) | (0.665) | (0.361) | (0.088) | (0.545) |
| $PPP_t$ | **-0.6456** ** | **-0.0072** | **-0.4179** | **-0.5468** ** | **-0.0456** | **-0.4585** | **-0.6221** ** | **-0.0304** | **-0.4632** | **-0.5818** ** | **-0.0420** | **-0.4656** |
| | (0.044) | (0.983) | (0.279) | (0.036) | (0.892) | (0.215) | (0.038) | (0.928) | (0.219) | (0.036) | (0.901) | (0.211) |
| $STK_t$ | **-0.4110** | **0.0227** | **0.1821** | **-0.3072** | **-0.0215** | **0.1317** | **-0.3945** | **-0.0018** | **0.1279** | **-0.3485** | **-0.0158** | **0.1265** |
| | (0.228) | (0.883) | (0.504) | (0.248) | (0.852) | (0.564) | (0.219) | (0.989) | (0.610) | (0.232) | (0.896) | (0.595) |
| $R^2$ within | 0.2185 | 0.0106 | 0.0066 | 0.2208 | 0.0106 | 0.0068 | 0.2199 | 0.0107 | 0.0066 | 0.2204 | 0.0107 | 0.0067 |
| F-statistic | 10.4481 | 3.9983 | 2.0590 | 10.1299 | 3.7325 | 2.1692 | 10.4660 | 3.7854 | 2.1599 | 10.2229 | 3.7299 | 2.2252 |
| p-value | 0.0000 | 0.0000 | 0.0102 | 0.0000 | 0.0000 | 0.0063 | 0.0000 | 0.0000 | 0.0066 | 0.0000 | 0.0000 | 0.0049 |
| Funds | 4998 | 4998 | 4998 | 4998 | 4998 | 4998 | 4998 | 4998 | 4998 | 4998 | 4998 | 4998 |
| Observations | 111354 | 111354 | 111354 | 111354 | 111354 | 111354 | 111354 | 111354 | 111354 | 111354 | 111354 | 111354 |

Table J.B. Results for the allocation funds sample. The PPB is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[2]{age_{i,t}}$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.1491** | **-0.9857*** | **-2.1531*** ** | **0.0379** | **-1.1433*** | **-2.1834*** * | **-0.3754** | **-1.0940*** | **-2.4720*** ** | **-0.4967** | **-1.1705*** | **-2.6180*** ** |
| | (0.804) | (0.081) | (0.009) | (0.944) | (0.058) | (0.015) | (0.471) | (0.065) | (0.007) | (0.344) | (0.064) | (0.010) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0581** | **-0.0170** | **0.0084** | **0.4612** | **0.0903** | **0.4332** | **0.4527** | **0.0220** | **0.3461** | **0.7672** | **0.1069** | **0.6780*** |
| | (0.203) | (0.523) | (0.849) | (0.140) | (0.470) | (0.107) | (0.119) | (0.824) | (0.119) | (0.130) | (0.544) | (0.097) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.9828*** ** | **0.5340*** ** | **-0.8139** | **-1.2423*** ** | **0.6733*** ** | **-1.1900*** | **-1.1980*** ** | **0.6697*** ** | **-1.1021** | **-1.3916*** ** | **0.7889*** ** | **-1.3716** |
| | (0.001) | (0.000) | (0.128) | (0.001) | (0.000) | (0.096) | (0.001) | (0.000) | (0.112) | (0.001) | (0.000) | (0.100) |
| $\boldsymbol{Bull_{i,t}}$ | **1.1859*** ** | **0.0255** | **-0.0084** | **1.1229*** ** | **0.1288** | **-0.1081** | **1.1069*** ** | **0.1043** | **-0.1008** | **1.0631*** ** | **0.1854** | **-0.1564** |
| | (0.001) | (0.848) | (0.971) | (0.002) | (0.400) | (0.721) | (0.002) | (0.484) | (0.739) | (0.004) | (0.309) | (0.674) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.2394** | **0.0159** | **0.1948** | **-0.2157** | **-0.0491** | **-0.2659** | **-0.0065** | **-0.0008** | **-0.0065** | **-0.1882** | **-0.0505** | **-0.2191** |
| | (0.165) | (0.814) | (0.216) | (0.172) | (0.708) | (0.162) | (0.957) | (0.994) | (0.972) | (0.247) | (0.731) | (0.322) |
| $\boldsymbol{Share_{i,t-1}}$ | **-0.0512** | **-0.0151** | **-0.0267** | **-0.0290** | **-0.0001** | **0.0162** | **-0.0319** | **-0.0059** | **0.0045** | **-0.0296** | **-0.0011** | **0.0140** |
| | (0.192) | (0.360) | (0.445) | (0.280) | (0.993) | (0.586) | (0.275) | (0.699) | (0.890) | (0.281) | (0.938) | (0.649) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0371** | **0.0090** | **0.0086** | **0.0305** | **0.0086** | **0.0060** | **0.0377** | **0.0093** | **0.0117** | **0.0330** | **0.0087** | **0.0077** |
| | (0.213) | (0.703) | (0.763) | (0.259) | (0.695) | (0.837) | (0.211) | (0.682) | (0.693) | (0.243) | (0.692) | (0.794) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.8609** | **0.4159** | **2.7112*** * | **1.4165** | **0.8231** | **4.2033*** ** | **1.9059*** | **0.7921** | **4.5390*** * | **2.4117*** | **1.0920** | **5.6949*** * |
| | (0.261) | (0.466) | (0.037) | (0.130) | (0.203) | (0.009) | (0.085) | (0.287) | (0.014) | (0.088) | (0.264) | (0.015) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.1414** | **0.1508** | **1.2167*** * | **0.7737** | **0.5662** | **2.5214*** ** | **0.9081*** | **0.4243** | **2.4001*** ** | **1.1768** | **0.6675** | **3.0858*** ** |
| | (0.691) | (0.665) | (0.026) | (0.121) | (0.153) | (0.002) | (0.096) | (0.335) | (0.004) | (0.118) | (0.236) | (0.004) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.2983** | **-0.1456** | **0.0720** | **0.2782** | **0.0409** | **1.0348*** | **0.2791** | **-0.0929** | **0.7844** | **0.4365** | **-0.0537** | **1.1094** |
| | (0.387) | (0.568) | (0.855) | (0.597) | (0.893) | (0.077) | (0.618) | (0.775) | (0.186) | (0.567) | (0.894) | (0.128) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.0609** | **0.0342** | **0.2914** | **0.3402** | **0.2491** | **0.9287*** * | **0.3722** | **0.1736** | **0.8934*** | **0.5222** | **0.2872** | **1.2060*** * |
| | (0.842) | (0.855) | (0.303) | (0.239) | (0.405) | (0.039) | (0.252) | (0.566) | (0.053) | (0.189) | (0.481) | (0.045) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **-0.2779** | **-0.1028** | **-0.4902*** | **-1.1032*** | **-0.3819** | **-1.8960*** * | **-1.0107*** | **-0.3162** | **-1.6554*** | **-1.6692*** | **-0.5619** | **-2.8140*** * |
| | (0.116) | (0.439) | (0.094) | (0.061) | (0.367) | (0.042) | (0.064) | (0.416) | (0.052) | (0.066) | (0.381) | (0.045) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **-0.0274** | **-0.0099** | **-0.0749** | **-0.4744** | **-0.1961** | **-0.8148*** * | **-0.3612** | **-0.1049** | **-0.5676*** | **-0.6860** | **-0.2671** | **-1.1572*** * |
| | (0.516) | (0.848) | (0.250) | (0.178) | (0.403) | (0.036) | (0.163) | (0.593) | (0.051) | (0.181) | (0.447) | (0.038) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **0.0269** | **0.0316** | **0.0468** | **-0.1958** | **0.0827** | **-0.1811** | **-0.1017** | **0.1026** | **-0.0326** | **-0.2620** | **0.1355** | **-0.2188** |
| | (0.513) | (0.243) | (0.247) | (0.528) | (0.564) | (0.381) | (0.654) | (0.380) | (0.845) | (0.559) | (0.520) | (0.473) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **-0.0047** | **-0.0002** | **-0.0234** | **-0.2206** | **-0.0817** | **-0.3423** | **-0.1545** | **-0.0387** | **-0.2426** | **-0.3138** | **-0.1082** | **-0.5035** |
| | (0.878) | (0.994) | (0.517) | (0.116) | (0.618) | (0.109) | (0.166) | (0.761) | (0.150) | (0.129) | (0.646) | (0.108) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **-0.0080*** | **-0.0007** | **-0.0113*** * | **0.1066** | **0.0085** | **0.0749** | **0.0216** | **-0.0033** | **-0.0093** | **0.1080** | **0.0114** | **0.0665** |
| | (0.098) | (0.744) | (0.040) | (0.103) | (0.795) | (0.143) | (0.319) | (0.853) | (0.774) | (0.123) | (0.794) | (0.326) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.0303*** ** | **-0.0229*** ** | **0.0332** | **0.2623*** ** | **-0.1676*** * | **0.3356** | **0.1763*** ** | **-0.1244*** * | **0.2142** | **0.3542*** ** | **-0.2386*** * | **0.4486** |
| | (0.005) | (0.007) | (0.170) | (0.006) | (0.030) | (0.104) | (0.005) | (0.015) | (0.133) | (0.005) | (0.023) | (0.112) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **0.0110** | **-0.0097** | **0.0051** | **0.0790** | **-0.0968** | **0.0809** | **0.0657** | **-0.0622** | **0.0562** | **0.1153** | **-0.1319** | **0.1100** |
| | (0.122) | (0.287) | (0.752) | (0.269) | (0.194) | (0.519) | (0.153) | (0.237) | (0.536) | (0.238) | (0.204) | (0.532) |
| $\boldsymbol{PPP_t}$ | **-0.5682** | **0.7703** | **1.5226*** * | **-0.4538** | **0.7896** | **1.6150*** * | **-0.5870** | **0.7692** | **1.4870*** * | **-0.5262** | **0.7833** | **1.5512*** * |
| | (0.394) | (0.103) | (0.022) | (0.455) | (0.104) | (0.015) | (0.382) | (0.109) | (0.026) | (0.412) | (0.106) | (0.020) |
| $\boldsymbol{STK_t}$ | **-0.4150** | **0.3909*** | **0.7549*** | **-0.3424** | **0.2972*** | **0.6356*** | **-0.4730** | **0.3155*** | **0.5645** | **-0.4052** | **0.2995*** | **0.5900** |
| | (0.345) | (0.065) | (0.079) | (0.378) | (0.064) | (0.084) | (0.299) | (0.064) | (0.154) | (0.336) | (0.065) | (0.120) |
| $R^2$ within | 0.2478 | 0.0310 | 0.0287 | 0.2537 | 0.0303 | 0.0315 | 0.2510 | 0.0304 | 0.0293 | 0.2526 | 0.0303 | 0.0306 |
| F-statistic | 7.8585 | 4.4039 | 2.1755 | 7.2770 | 3.1940 | 2.0842 | 7.8199 | 3.7937 | 1.9501 | 7.4794 | 3.2643 | 2.0262 |
| p-value | 0.0000 | 0.0000 | 0.0075 | 0.0000 | 0.0001 | 0.0110 | 0.0000 | 0.0000 | 0.0188 | 0.0000 | 0.0001 | 0.0139 |
| Funds | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 |
| Observations | 7993 | 7993 | 7993 | 7993 | 7993 | 7993 | 7993 | 7993 | 7993 | 7993 | 7993 | 7993 |

Table J.C. Results for the fixed income funds sample. The PPB is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[2]{age_{i,t}}$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.6021** | **-0.0972** | **-0.3749** | **-0.4446** | **-0.0676** | **-0.3105** | **-0.6866*** | **-0.1055** | **-0.3997** | **-0.7183** | **-0.1195** | **-0.4227** |
| | (0.118) | (0.852) | (0.397) | (0.254) | (0.896) | (0.490) | (0.086) | (0.844) | (0.374) | (0.130) | (0.836) | (0.400) |
| $f(age_{i,t})$ | **0.0152** | **-0.0126** | **-0.0115** | **0.1685** | **0.0448** | **0.0813** | **0.1481** | **0.0023** | **0.0362** | **0.2832** | **0.0547** | **0.1199** |
| | (0.692) | (0.456) | (0.653) | (0.519) | (0.804) | (0.711) | (0.514) | (0.986) | (0.832) | (0.490) | (0.834) | (0.718) |
| $Bear_{i,t}$ | **-0.1756** | **0.3664**** | **0.0405** | **-0.1766** | **0.4537*** | **0.1145** | **-0.2247** | **0.4255*** | **0.0590** | **-0.2699** | **0.4833** | **0.0796** |
| | (0.497) | (0.033) | (0.765) | (0.530) | (0.086) | (0.584) | (0.431) | (0.078) | (0.758) | (0.384) | (0.122) | (0.762) |
| $Bull_{i,t}$ | **1.2146***** | **0.0313** | **-0.0239** | **1.2371***** | **0.1246** | **0.0203** | **1.1852***** | **0.0972** | **-0.0210** | **1.1626***** | **0.1646** | **-0.0120** |
| | (0.000) | (0.848) | (0.856) | (0.000) | (0.607) | (0.925) | (0.000) | (0.664) | (0.915) | (0.000) | (0.562) | (0.965) |
| $Size_{i,t-1}$ | **0.1410** | **0.0574** | **0.0764** | **-0.1446** | **-0.0296** | **-0.0845** | **0.0429** | **0.0434** | **0.0300** | **-0.0863** | **-0.0087** | **-0.0532** |
| | (0.169) | (0.454) | (0.409) | (0.155) | (0.700) | (0.505) | (0.634) | (0.590) | (0.783) | (0.406) | (0.922) | (0.709) |
| $Share_{i,t-1}$ | **0.0003** | **0.0014** | **-0.0092** | **0.0060** | **0.0039** | **-0.0050** | **0.0028** | **0.0023** | **-0.0073** | **0.0046** | **0.0034** | **-0.0058** |
| | (0.969) | (0.886) | (0.450) | (0.322) | (0.659) | (0.648) | (0.669) | (0.803) | (0.530) | (0.467) | (0.709) | (0.607) |
| $ABIshare_{i,t-1}$ | **0.0076** | **0.0255** | **0.0526***** | **0.0185** | **0.0362*** | **0.0646***** | **0.0163** | **0.0328*** | **0.0617***** | **0.0188** | **0.0357*** | **0.0645***** |
| | (0.681) | (0.109) | (0.007) | (0.423) | (0.051) | (0.006) | (0.465) | (0.073) | (0.008) | (0.417) | (0.060) | (0.008) |
| $p0\_5_{i,t}$ | **-0.3181** | **-0.6127** | **-0.6112** | **-0.4675** | **-0.7770** | **-0.7566** | **-0.4768** | **-0.9750** | **-0.9164** | **-0.7477** | **-1.3486** | **-1.2773*** |
| | (0.448) | (0.128) | (0.167) | (0.298) | (0.173) | (0.132) | (0.373) | (0.124) | (0.101) | (0.238) | (0.125) | (0.078) |
| $p5\_10_{i,t}$ | **0.1025** | **-0.1809** | **-0.2609** | **0.4276** | **-0.0153** | **-0.1149** | **0.4038** | **-0.0921** | **-0.1901** | **0.5788** | **-0.0019** | **-0.1769** |
| | (0.723) | (0.492) | (0.390) | (0.375) | (0.975) | (0.816) | (0.431) | (0.837) | (0.690) | (0.383) | (0.998) | (0.784) |
| $p10\_15_{i,t}$ | **-0.0060** | **0.0335** | **-0.1281** | **0.3251** | **0.2896** | **0.1633** | **0.2111** | **0.1756** | **0.0090** | **0.3316** | **0.3178** | **0.1042** |
| | (0.980) | (0.821) | (0.596) | (0.356) | (0.177) | (0.639) | (0.556) | (0.385) | (0.978) | (0.456) | (0.225) | (0.808) |
| $p15\_20_{i,t}$ | **0.0271** | **0.0376** | **-0.0220** | **0.1244** | **0.1027** | **0.0812** | **0.0861** | **0.0708** | **0.0126** | **0.0888** | **0.1055** | **0.0208** |
| | (0.909) | (0.754) | (0.912) | (0.773) | (0.673) | (0.824) | (0.834) | (0.739) | (0.970) | (0.866) | (0.713) | (0.963) |
| $f(age_{i,t})\cdot p0\_5_{i,t}$ | **0.1895**** | **0.1881** | **0.2043*** | **0.4557*** | **0.6576*** | **0.6536**** | **0.4429*** | **0.6163*** | **0.6193**** | **0.6783*** | **1.0282*** | **1.0068**** |
| | (0.033) | (0.129) | (0.067) | (0.051) | (0.099) | (0.037) | (0.051) | (0.090) | (0.036) | (0.060) | (0.091) | (0.034) |
| $f(age_{i,t})\cdot p5\_10_{i,t}$ | **0.0086** | **0.0027** | **0.0263** | **-0.1949** | **-0.0176** | **0.0572** | **-0.1022** | **0.0070** | **0.0801** | **-0.2617** | **-0.0279** | **0.1061** |
| | (0.784) | (0.926) | (0.402) | (0.412) | (0.937) | (0.804) | (0.553) | (0.964) | (0.620) | (0.443) | (0.931) | (0.745) |
| $f(age_{i,t})\cdot p10\_15_{i,t}$ | **0.0239** | **-0.0041** | **0.0243** | **-0.0713** | **-0.0897** | **-0.0004** | **0.0045** | **-0.0370** | **0.0541** | **-0.0649** | **-0.1127** | **0.0355** |
| | (0.103) | (0.695) | (0.207) | (0.612) | (0.245) | (0.998) | (0.961) | (0.478) | (0.572) | (0.736) | (0.290) | (0.856) |
| $f(age_{i,t})\cdot p15\_20_{i,t}$ | **0.0163** | **-0.0030** | **0.0138** | **0.0374** | **-0.0110** | **0.0459** | **0.0465** | **-0.0048** | **0.0540** | **0.0646** | **-0.0149** | **0.0815** |
| | (0.261) | (0.658) | (0.371) | (0.808) | (0.896) | (0.737) | (0.641) | (0.923) | (0.550) | (0.756) | (0.892) | (0.663) |
| $f(age_{i,t})\cdot Size_{i,t-1}$ | **-0.0043** | **-0.0015** | **-0.0026** | **0.0737*** | **0.0180** | **0.0363** | **0.0053** | **-0.0042** | **-0.0016** | **0.0593** | **0.0125** | **0.0287** |
| | (0.271) | (0.631) | (0.527) | (0.074) | (0.492) | (0.430) | (0.779) | (0.797) | (0.947) | (0.167) | (0.701) | (0.607) |
| $f(age_{i,t})\cdot Bear_{i,t}$ | **0.0187**** | **-0.0049** | **0.0080** | **0.0842** | **-0.0682** | **-0.0047** | **0.0803*** | **-0.0390** | **0.0186** | **0.1385** | **-0.0866** | **0.0148** |
| | (0.026) | (0.577) | (0.484) | (0.180) | (0.473) | (0.965) | (0.080) | (0.513) | (0.795) | (0.118) | (0.492) | (0.920) |
| $f(age_{i,t})\cdot Bull_{i,t}$ | **0.0147** | **-0.0073** | **0.0070** | **0.0538** | **-0.0835** | **0.0063** | **0.0589** | **-0.0503** | **0.0206** | **0.0959** | **-0.1081** | **0.0241** |
| | (0.125) | (0.359) | (0.547) | (0.503) | (0.289) | (0.952) | (0.279) | (0.318) | (0.766) | (0.384) | (0.301) | (0.865) |
| $PPP_t$ | **-0.2609** | **0.0710** | **0.3561** | **-0.2201** | **0.0069** | **0.3025** | **-0.2601** | **0.0199** | **0.3013** | **-0.2423** | **0.0082** | **0.2950** |
| | (0.495) | (0.872) | (0.357) | (0.507) | (0.988) | (0.424) | (0.471) | (0.964) | (0.438) | (0.481) | (0.985) | (0.442) |
| $STK_t$ | **-0.1755** | **0.0316** | **-0.0584** | **-0.2089** | **-0.0763** | **-0.1642** | **-0.2301** | **-0.0475** | **-0.1503** | **-0.2294** | **-0.0730** | **-0.1703** |
| | (0.587) | (0.826) | (0.798) | (0.458) | (0.594) | (0.452) | (0.474) | (0.757) | (0.531) | (0.448) | (0.630) | (0.464) |
| $R^2$ within | 0.1506 | 0.0140 | 0.0044 | 0.1510 | 0.0141 | 0.0043 | 0.1499 | 0.0139 | 0.0040 | 0.1504 | 0.0140 | 0.0042 |
| F-statistic | 5.2102 | 7.2050 | 2.1659 | 5.8984 | 5.9391 | 2.6964 | 5.3971 | 6.5953 | 2.5218 | 5.6833 | 6.0993 | 2.6593 |
| p-value | 0.0000 | 0.0000 | 0.0064 | 0.0000 | 0.0000 | 0.0006 | 0.0000 | 0.0000 | 0.0013 | 0.0000 | 0.0000 | 0.0007 |
| Funds | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 | 737 |
| Observations | 16805 | 16805 | 16805 | 16805 | 16805 | 16805 | 16805 | 16805 | 16805 | 16805 | 16805 | 16805 |

Table J.D. Results for the equity funds sample. The PPB is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[2]{age_{i,t}}$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.3467** | **0.2493** | **0.8976*** | **0.4626** | **0.2145** | **0.9714*** | **0.2514** | **0.2608** | **0.9118*** | **0.1238** | **0.2878** | **0.9053*** |
| | (0.235) | (0.533) | (0.077) | (0.139) | (0.589) | (0.073) | (0.399) | (0.505) | (0.074) | (0.719) | (0.465) | (0.085) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0633** | **-0.0072** | **0.0111** | **0.2720** | **-0.0534** | **0.0420** | **0.3088** | **-0.0511** | **0.0610** | **0.4789** | **-0.0882** | **0.0807** |
| | (0.138) | (0.650) | (0.630) | (0.147) | (0.392) | (0.653) | (0.131) | (0.421) | (0.531) | (0.142) | (0.384) | (0.601) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.7255*** | **0.1877** | **-0.5258** | **-0.8251*** | **0.1703** | **-0.5285*** | **-0.8060*** | **0.1724** | **-0.5430*** | **-0.8795*** | **0.1574** | **-0.5533*** |
| | (0.000) | (0.182) | (0.042) | (0.000) | (0.385) | (0.064) | (0.000) | (0.343) | (0.054) | (0.000) | (0.487) | (0.071) |
| $\boldsymbol{Bull_{i,t}}$ | **1.2948*** | **-0.0770** | **0.0609** | **1.3161*** | **-0.0447** | **0.1478** | **1.3043*** | **-0.0504** | **0.1227** | **1.3225*** | **-0.0254** | **0.1852** |
| | (0.000) | (0.583) | (0.694) | (0.000) | (0.791) | (0.422) | (0.000) | (0.756) | (0.481) | (0.000) | (0.891) | (0.365) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0835** | **-0.0205** | **-0.0093** | **-0.1563*** | **0.0301** | **-0.1017** | **-0.0623** | **0.0035** | **-0.0709** | **-0.1504*** | **0.0189** | **-0.1091** |
| | (0.356) | (0.449) | (0.902) | (0.094) | (0.492) | (0.390) | (0.245) | (0.925) | (0.473) | (0.092) | (0.689) | (0.390) |
| $\boldsymbol{Share_{i,t-1}}$ | **-0.0020** | **-0.0003** | **-0.0154** | **0.0069** | **-0.0026** | **-0.0121** | **0.0038** | **-0.0016** | **-0.0132** | **0.0052** | **-0.0020** | **-0.0128** |
| | (0.784) | (0.937) | (0.280) | (0.173) | (0.521) | (0.343) | (0.487) | (0.717) | (0.330) | (0.311) | (0.632) | (0.328) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0044** | **0.0105** | **0.0347** | **0.0009** | **0.0113** | **0.0339** | **0.0024** | **0.0109** | **0.0343** | **0.0016** | **0.0111** | **0.0342** |
| | (0.537) | (0.140) | (0.010) | (0.907) | (0.115) | (0.012) | (0.740) | (0.125) | (0.011) | (0.828) | (0.120) | (0.011) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.1263** | **-0.0705** | **-0.1426** | **-0.2837** | **-0.1426** | **-0.3462** | **-0.0270** | **-0.1992** | **-0.3097** | **-0.3355** | **-0.2786** | **-0.5586** |
| | (0.692) | (0.748) | (0.709) | (0.400) | (0.596) | (0.373) | (0.946) | (0.481) | (0.503) | (0.489) | (0.419) | (0.297) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.3721** | **-0.4067** | **0.0222** | **0.3330** | **-0.6096** | **-0.1082** | **0.5412** | **-0.6202** | **0.0004** | **0.5206** | **-0.7914*** | **-0.1113** |
| | (0.352) | (0.018) | (0.926) | (0.465) | (0.013) | (0.736) | (0.352) | (0.010) | (0.999) | (0.429) | (0.009) | (0.785) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.2216** | **-0.1684** | **-0.0267** | **0.2379** | **-0.2687** | **-0.1438** | **0.3804** | **-0.2749** | **-0.0824** | **0.3590** | **-0.3346** | **-0.1938** |
| | (0.498) | (0.262) | (0.909) | (0.574) | (0.133) | (0.615) | (0.453) | (0.138) | (0.784) | (0.540) | (0.122) | (0.587) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.2323** | **-0.0166** | **0.1897** | **0.3433** | **-0.0391** | **0.2593** | **0.4078** | **-0.0375** | **0.2874** | **0.4636** | **-0.0369** | **0.3386** |
| | (0.309) | (0.859) | (0.179) | (0.228) | (0.731) | (0.147) | (0.223) | (0.738) | (0.125) | (0.210) | (0.783) | (0.136) |
| $\boldsymbol{f(age_{i,t})\cdot p0\_5_{i,t}}$ | **0.1057** | **0.0219** | **0.0810** | **0.2543** | **0.1284** | **0.2849** | **0.2020** | **0.1139** | **0.2411** | **0.3507** | **0.2092** | **0.4393** |
| | (0.202) | (0.635) | (0.227) | (0.268) | (0.345) | (0.178) | (0.324) | (0.373) | (0.230) | (0.296) | (0.311) | (0.173) |
| $\boldsymbol{f(age_{i,t})\cdot p5\_10_{i,t}}$ | **0.0041** | **0.0219** | **-0.0199** | **-0.1420** | **0.2042** | **-0.0041** | **-0.1170** | **0.1515*** | **-0.0335** | **-0.2116** | **0.3135** | **0.0096** |
| | (0.886) | (0.297) | (0.514) | (0.491) | (0.042) | (0.977) | (0.501) | (0.061) | (0.772) | (0.498) | (0.033) | (0.964) |
| $\boldsymbol{f(age_{i,t})\cdot p10\_15_{i,t}}$ | **0.0068** | **0.0083** | **0.0164** | **-0.0885** | **0.0833** | **0.0945** | **-0.0689** | **0.0602** | **0.0637** | **-0.1287** | **0.1204** | **0.1346** |
| | (0.732) | (0.422) | (0.343) | (0.609) | (0.189) | (0.393) | (0.619) | (0.230) | (0.458) | (0.618) | (0.196) | (0.402) |
| $\boldsymbol{f(age_{i,t})\cdot p15\_20_{i,t}}$ | **-0.0078** | **-0.0041** | **-0.0145** | **-0.1350** | **-0.0059** | **-0.1060** | **-0.0972** | **-0.0081** | **-0.0818** | **-0.1904** | **-0.0093** | **-0.1499** |
| | (0.380) | (0.425) | (0.150) | (0.132) | (0.893) | (0.165) | (0.166) | (0.788) | (0.143) | (0.148) | (0.879) | (0.167) |
| $\boldsymbol{f(age_{i,t})\cdot Size_{i,t-1}}$ | **-0.0014** | **0.0008** | **0.0015** | **0.0791*** | **-0.0126** | **0.0408** | **0.0300** | **-0.0022** | **0.0208** | **0.0852*** | **-0.0097** | **0.0488** |
| | (0.478) | (0.430) | (0.352) | (0.091) | (0.340) | (0.252) | (0.049) | (0.768) | (0.212) | (0.078) | (0.551) | (0.249) |
| $\boldsymbol{f(age_{i,t})\cdot Bear_{i,t}}$ | **0.0103*** | **0.0021** | **0.0068** | **0.1020*** | **0.0188** | **0.0288** | **0.0658*** | **0.0133** | **0.0273** | **0.1349*** | **0.0267** | **0.0439** |
| | (0.065) | (0.746) | (0.276) | (0.052) | (0.769) | (0.627) | (0.051) | (0.751) | (0.477) | (0.051) | (0.758) | (0.575) |
| $\boldsymbol{f(age_{i,t})\cdot Bull_{i,t}}$ | **-0.0012** | **-0.0030** | **-0.0053** | **-0.0133** | **-0.0307** | **-0.0692** | **-0.0065** | **-0.0201** | **-0.0414** | **-0.0181** | **-0.0423** | **-0.0925** |
| | (0.754) | (0.468) | (0.441) | (0.755) | (0.439) | (0.266) | (0.805) | (0.431) | (0.315) | (0.750) | (0.425) | (0.273) |
| $\boldsymbol{PPP_t}$ | **-0.7425** | **-0.0208** | **-0.8283*** | **-0.6252** | **-0.0297** | **-0.8063*** | **-0.7084** | **-0.0193** | **-0.8293*** | **-0.6622** | **-0.0263** | **-0.8185*** |
| | (0.020) | (0.954) | (0.061) | (0.016) | (0.932) | (0.059) | (0.017) | (0.956) | (0.056) | (0.016) | (0.940) | (0.057) |
| $\boldsymbol{STK_t}$ | **-0.4655** | **-0.0254** | **0.1412** | **-0.3175** | **-0.0290** | **0.1819** | **-0.4193** | **-0.0167** | **0.1509** | **-0.3619** | **-0.0229** | **0.1703** |
| | (0.216) | (0.892) | (0.647) | (0.266) | (0.845) | (0.482) | (0.221) | (0.919) | (0.590) | (0.245) | (0.882) | (0.524) |
| $R^2$ within | 0.2561 | 0.0085 | 0.0103 | 0.2580 | 0.0088 | 0.0104 | 0.2576 | 0.0087 | 0.0104 | 0.2578 | 0.0088 | 0.0104 |
| F-statistic | 9.2214 | 3.5571 | 2.5101 | 8.3306 | 3.4554 | 2.7325 | 8.6302 | 3.4769 | 2.7131 | 8.4081 | 3.4639 | 2.7637 |
| p-value | 0.0000 | 0.0000 | 0.0014 | 0.0000 | 0.0000 | 0.0005 | 0.0000 | 0.0000 | 0.0005 | 0.0000 | 0.0000 | 0.0004 |
| Funds | 3617 | 3617 | 3617 | 3617 | 3617 | 3617 | 3617 | 3617 | 3617 | 3617 | 3617 | 3617 |
| Observations | 82149 | 82149 | 82149 | 82149 | 82149 | 82149 | 82149 | 82149 | 82149 | 82149 | 82149 | 82149 |

Table J.E. Results for the emerging equity funds sample. The PPB is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[2]{age_{i,t}}$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.0352** | **0.1441** | **-0.2912** | **0.0978** | **-0.0842** | **0.3714** | **-0.0395** | **-0.0740** | **-0.4729** | **-0.2114** | **-0.1689** | **-0.9238** |
| | (0.917) | (0.752) | (0.621) | (0.806) | (0.847) | (0.711) | (0.896) | (0.863) | (0.441) | (0.517) | (0.706) | (0.216) |
| $f(age_{i,t})$ | **0.0875** | **-0.0074** | **0.1711** | **0.3153** | **0.1705** | **1.1493**** | **0.3469** | **0.0487** | **1.0695*** | **0.5286** | **0.2113** | **1.8716**** |
| | (0.123) | (0.851) | (0.229) | (0.159) | (0.192) | (0.028) | (0.179) | (0.672) | (0.090) | (0.178) | (0.271) | (0.044) |
| $Bear_{i,t}$ | **-0.8542***** | **0.0665** | **-0.8413***** | **-0.9062***** | **0.0429** | **-0.8329**** | **-0.9151***** | **0.0962** | **-0.8261**** | **-0.9519***** | **0.1164** | **-0.7448*** |
| | (0.000) | (0.657) | (0.009) | (0.000) | (0.827) | (0.026) | (0.000) | (0.637) | (0.029) | (0.000) | (0.652) | (0.098) |
| $Bull_{i,t}$ | **1.3092***** | **0.0097** | **0.5951** | **1.3940***** | **0.0141** | **0.7751** | **1.3651***** | **0.0109** | **0.7195** | **1.4331***** | **0.0228** | **0.8853** |
| | (0.000) | (0.925) | (0.409) | (0.000) | (0.927) | (0.284) | (0.000) | (0.943) | (0.327) | (0.000) | (0.913) | (0.258) |
| $Size_{i,t-1}$ | **0.0294** | **0.1145**** | **0.5220**** | **-0.1112** | **0.2240***** | **-0.0174** | **-0.0769** | **0.2382***** | **0.2990*** | **-0.1271** | **0.2775***** | **0.1011** |
| | (0.736) | (0.023) | (0.011) | (0.446) | (0.001) | (0.962) | (0.326) | (0.000) | (0.091) | (0.386) | (0.001) | (0.777) |
| $Share_{i,t-1}$ | **-0.0077** | **-0.0163**** | **-0.0236** | **-0.0038** | **-0.0189**** | **-0.0041** | **-0.0047** | **-0.0193***** | **-0.0136** | **-0.0043** | **-0.0186**** | **-0.0085** |
| | (0.341) | (0.015) | (0.173) | (0.712) | (0.015) | (0.855) | (0.611) | (0.010) | (0.486) | (0.658) | (0.014) | (0.680) |
| $ABIshare_{i,t-1}$ | **0.0080** | **0.0045** | **-0.0015** | **0.0204** | **-0.0021** | **0.0079** | **0.0138** | **0.0004** | **-0.0065** | **0.0181** | **-0.0035** | **0.0012** |
| | (0.802) | (0.903) | (0.985) | (0.477) | (0.954) | (0.922) | (0.655) | (0.992) | (0.938) | (0.539) | (0.926) | (0.988) |
| $p0\_5_{i,t}$ | **0.8034** | **-0.1044** | **0.0153** | **0.3933** | **0.5172** | **-0.0834** | **0.7357** | **0.2532** | **0.6938** | **0.6154** | **0.4757** | **0.5476** |
| | (0.163) | (0.873) | (0.991) | (0.567) | (0.496) | (0.960) | (0.282) | (0.753) | (0.679) | (0.488) | (0.632) | (0.802) |
| $p5\_10_{i,t}$ | **0.5935** | **-1.5104**** | **-0.4346** | **0.0591** | **-1.4489** | **-0.9916** | **0.2608** | **-2.0390*** | **-0.6485** | **-0.0660** | **-2.5878*** | **-1.5311** |
| | (0.344) | (0.036) | (0.782) | (0.933) | (0.107) | (0.578) | (0.766) | (0.052) | (0.773) | (0.953) | (0.072) | (0.605) |
| $p10\_15_{i,t}$ | **-0.0094** | **-0.3900** | **-0.4945** | **-0.5658** | **0.0395** | **-0.7546** | **-0.4186** | **-0.1441** | **-0.2551** | **-0.7555** | **0.0050** | **-0.5090** |
| | (0.982) | (0.485) | (0.543) | (0.334) | (0.958) | (0.544) | (0.418) | (0.846) | (0.795) | (0.255) | (0.996) | (0.685) |
| $p15\_20_{i,t}$ | **0.1784** | **-0.5272** | **0.4460** | **0.1957** | **-0.4959** | **1.0477** | **0.2821** | **-0.5912** | **1.2335** | **0.3375** | **-0.6242** | **1.6642** |
| | (0.656) | (0.194) | (0.643) | (0.707) | (0.345) | (0.370) | (0.622) | (0.270) | (0.366) | (0.630) | (0.376) | (0.305) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **-0.0614** | **0.0388** | **0.1265** | **-0.0783** | **-0.0820** | **0.0377** | **-0.1491** | **0.0178** | **-0.1072** | **-0.1771** | **-0.0770** | **-0.2449** |
| | (0.773) | (0.836) | (0.793) | (0.879) | (0.875) | (0.975) | (0.742) | (0.970) | (0.925) | (0.798) | (0.919) | (0.891) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.1322** | **0.5157*** | **0.4646** | **0.3511** | **1.3109*** | **1.1330** | **0.2938** | **1.3196*** | **1.0402** | **0.4726** | **2.0076*** | **1.6536** |
| | (0.606) | (0.052) | (0.472) | (0.588) | (0.077) | (0.502) | (0.631) | (0.060) | (0.522) | (0.615) | (0.078) | (0.512) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0907**** | **0.0108** | **0.0619** | **0.3417** | **-0.0445** | **0.0271** | **0.2907** | **0.0011** | **0.0273** | **0.5121** | **-0.0519** | **0.0330** |
| | (0.038) | (0.883) | (0.558) | (0.132) | (0.901) | (0.948) | (0.100) | (0.997) | (0.940) | (0.121) | (0.922) | (0.958) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0160** | **0.0272** | **-0.0931** | **-0.1586** | **0.1651** | **-0.7044** | **-0.1204** | **0.1364** | **-0.5381** | **-0.2229** | **0.2286** | **-1.0221** |
| | (0.670) | (0.591) | (0.314) | (0.514) | (0.570) | (0.221) | (0.521) | (0.546) | (0.242) | (0.525) | (0.590) | (0.222) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0029** | **-0.0076***** | **-0.0254***** | **0.0464** | **-0.0848***** | **0.0717** | **0.0207** | **-0.0638***** | **-0.0412** | **0.0566** | **-0.1170***** | **0.0244** |
| | (0.418) | (0.007) | (0.001) | (0.475) | (0.004) | (0.672) | (0.378) | (0.000) | (0.510) | (0.422) | (0.001) | (0.893) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0149***** | **-0.0244** | **-0.0035** | **0.0904*** | **-0.0611** | **-0.0300** | **0.0699**** | **-0.0730** | **-0.0266** | **0.1179*** | **-0.1091** | **-0.0850** |
| | (0.009) | (0.165) | (0.901) | (0.061) | (0.544) | (0.871) | (0.033) | (0.358) | (0.845) | (0.069) | (0.449) | (0.749) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0014** | **0.0012** | **-0.0124** | **-0.0679** | **0.0021** | **-0.1807** | **-0.0352** | **0.0034** | **-0.1007** | **-0.0909** | **-0.0043** | **-0.2434** |
| | (0.900) | (0.926) | (0.615) | (0.425) | (0.981) | (0.355) | (0.547) | (0.959) | (0.436) | (0.443) | (0.973) | (0.366) |
| $PPP_t$ | | | | | | | | | | | | |
| $STK_t$ | **-0.2483** | **-0.0848** | **-1.5403** | **-0.0795** | **-0.2490** | **-1.6094** | **-0.1823** | **-0.1679** | **-1.7660** | **-0.1158** | **-0.2289** | **-1.6949** |
| | (0.619) | (0.826) | (0.207) | (0.852) | (0.491) | (0.117) | (0.710) | (0.645) | (0.147) | (0.797) | (0.528) | (0.124) |
| $R^2$ within | 0.3363 | 0.0203 | 0.0874 | 0.3376 | 0.0189 | 0.0900 | 0.3375 | 0.0202 | 0.0882 | 0.3376 | 0.0193 | 0.0895 |
| F-statistic | 8.4273 | 2.6890 | 2.6273 | 9.4487 | 2.6307 | 4.4298 | 8.8763 | 3.1179 | 4.4452 | 9.3365 | 2.9376 | 4.4702 |
| p-value | 0.0000 | 0.0012 | 0.0015 | 0.0000 | 0.0015 | 0.0000 | 0.0000 | 0.0002 | 0.0000 | 0.0000 | 0.0004 | 0.0000 |
| Funds | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 | 186 |
| Observations | 2767 | 2767 | 2767 | 2767 | 2767 | 2767 | 2767 | 2767 | 2767 | 2767 | 2767 | 2767 |

Table J.F. Results for the international equity funds sample. The PPB is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[2]{age_{i,t}}$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.4484** | **-0.1363** | **0.3446** | **-0.3216** | **-0.1508** | **0.3495** | **-0.6021** | **-0.1627** | **0.2859** | **-0.7633** | **-0.1831** | **0.2199** |
| | (0.288) | (0.765) | (0.545) | (0.429) | (0.740) | (0.533) | (0.221) | (0.714) | (0.604) | (0.187) | (0.682) | (0.688) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0641** | **0.0088** | **0.0191** | **0.3797** | **0.0455** | **0.1404** | **0.3700** | **0.0424** | **0.1339** | **0.6255** | **0.0681** | **0.2177** |
| | (0.174) | (0.669) | (0.473) | (0.102) | (0.515) | (0.186) | (0.113) | (0.580) | (0.234) | (0.106) | (0.560) | (0.219) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.7000*** ** | **0.2079** | **-0.4621*** ** | **-0.8335*** ** | **0.1688** | **-0.4862*** | **-0.8092*** ** | **0.1739** | **-0.4833*** | **-0.9147*** ** | **0.1394** | **-0.5050** |
| | (0.000) | (0.237) | (0.040) | (0.000) | (0.443) | (0.085) | (0.000) | (0.410) | (0.076) | (0.000) | (0.577) | (0.112) |
| $\boldsymbol{Bull_{i,t}}$ | **1.3309*** ** | **-0.0491** | **0.0275** | **1.3206*** ** | **0.0001** | **0.0722** | **1.3162*** ** | **-0.0122** | **0.0638** | **1.3100*** ** | **0.0228** | **0.0971** |
| | (0.001) | (0.656) | (0.842) | (0.001) | (0.999) | (0.665) | (0.001) | (0.926) | (0.679) | (0.002) | (0.882) | (0.607) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.1678** | **0.0063** | **0.0136** | **-0.1249** | **-0.0053** | **-0.0911** | **0.0173** | **-0.0022** | **-0.0582** | **-0.0900** | **-0.0052** | **-0.0922** |
| | (0.131) | (0.858) | (0.780) | (0.115) | (0.933) | (0.399) | (0.810) | (0.966) | (0.501) | (0.266) | (0.939) | (0.421) |
| $\boldsymbol{Share_{i,t-1}}$ | **-0.0233** | **0.0185** | **0.0061** | **0.0029** | **0.0188** | **0.0163** | **-0.0074** | **0.0190** | **0.0137** | **-0.0022** | **0.0187** | **0.0145** |
| | (0.340) | (0.186) | (0.811) | (0.859) | (0.200) | (0.563) | (0.699) | (0.200) | (0.619) | (0.899) | (0.202) | (0.601) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0551*** | **0.0040** | **0.0494*** | **0.0372** | **0.0031** | **0.0427** | **0.0464*** | **0.0034** | **0.0458** | **0.0415** | **0.0032** | **0.0441** |
| | (0.076) | (0.744) | (0.084) | (0.120) | (0.809) | (0.146) | (0.094) | (0.789) | (0.114) | (0.107) | (0.802) | (0.130) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.1567** | **-0.1850** | **-0.1093** | **-0.3169** | **-0.2797** | **-0.0608** | **-0.2073** | **-0.3379** | **-0.1184** | **-0.5033** | **-0.5166** | **-0.3256** |
| | (0.661) | (0.526) | (0.814) | (0.493) | (0.452) | (0.901) | (0.678) | (0.368) | (0.834) | (0.440) | (0.258) | (0.622) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.4881** | **-0.3741*** ** | **0.0442** | **0.7699** | **-0.5407*** | **0.0793** | **0.9103** | **-0.5221*** | **0.1456** | **1.0619** | **-0.6942*** | **0.0722** |
| | (0.216) | (0.044) | (0.844) | (0.143) | (0.067) | (0.822) | (0.147) | (0.059) | (0.668) | (0.154) | (0.065) | (0.876) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.3530** | **0.0841** | **0.3115** | **0.6350** | **0.1352** | **0.3790** | **0.7118** | **0.1593** | **0.4373** | **0.8205** | **0.2134** | **0.4322** |
| | (0.333) | (0.675) | (0.276) | (0.223) | (0.602) | (0.309) | (0.230) | (0.539) | (0.262) | (0.250) | (0.498) | (0.374) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.3283** | **0.0712** | **0.3055*** | **0.5508** | **0.1370** | **0.4328*** | **0.5851** | **0.1445** | **0.4705*** ** | **0.6889** | **0.1970** | **0.5548*** |
| | (0.226) | (0.565) | (0.092) | (0.129) | (0.384) | (0.058) | (0.145) | (0.346) | (0.043) | (0.133) | (0.303) | (0.053) |
| $\boldsymbol{f(age_{i,t})\cdot p0\_5_{i,t}}$ | **0.1693** | **0.1021** | **0.1546** | **0.3727** | **0.2845** | **0.3282** | **0.3458** | **0.2687** | **0.3252** | **0.5438** | **0.4407** | **0.5089** |
| | (0.120) | (0.118) | (0.123) | (0.211) | (0.135) | (0.241) | (0.207) | (0.135) | (0.227) | (0.218) | (0.127) | (0.229) |
| $\boldsymbol{f(age_{i,t})\cdot p5\_10_{i,t}}$ | **-0.0257** | **0.0293** | **-0.0073** | **-0.3264** | **0.1775** | **-0.0260** | **-0.2506** | **0.1363** | **-0.0318** | **-0.4710** | **0.2781** | **-0.0128** |
| | (0.454) | (0.350) | (0.835) | (0.188) | (0.248) | (0.887) | (0.222) | (0.279) | (0.823) | (0.205) | (0.223) | (0.962) |
| $\boldsymbol{f(age_{i,t})\cdot p10\_15_{i,t}}$ | **-0.0057** | **-0.0167** | **-0.0047** | **-0.2124** | **-0.0990** | **-0.0532** | **-0.1505** | **-0.0807** | **-0.0486** | **-0.2998** | **-0.1456** | **-0.0790** |
| | (0.844) | (0.357) | (0.868) | (0.341) | (0.329) | (0.746) | (0.399) | (0.334) | (0.712) | (0.366) | (0.334) | (0.746) |
| $\boldsymbol{f(age_{i,t})\cdot p15\_20_{i,t}}$ | **-0.0112** | **-0.0124** | **-0.0238*** | **-0.1763** | **-0.0886** | **-0.1603*** | **-0.1225** | **-0.0669** | **-0.1260*** | **-0.2454** | **-0.1246** | **-0.2304*** |
| | (0.330) | (0.203) | (0.069) | (0.122) | (0.227) | (0.098) | (0.158) | (0.211) | (0.074) | (0.137) | (0.229) | (0.094) |
| $\boldsymbol{f(age_{i,t})\cdot Size_{i,t-1}}$ | **-0.0043*** | **-0.0004** | **0.0003** | **0.0745*** | **0.0023** | **0.0351** | **0.0163** | **0.0005** | **0.0165** | **0.0694*** | **0.0025** | **0.0402** |
| | (0.088) | (0.671) | (0.773) | (0.063) | (0.897) | (0.221) | (0.198) | (0.956) | (0.265) | (0.081) | (0.910) | (0.263) |
| $\boldsymbol{f(age_{i,t})\cdot Bear_{i,t}}$ | **0.0151*** ** | **0.0054** | **0.0039** | **0.1428*** ** | **0.0450** | **0.0313** | **0.0930*** ** | **0.0310** | **0.0212** | **0.1914*** ** | **0.0628** | **0.0427** |
| | (0.022) | (0.466) | (0.661) | (0.017) | (0.497) | (0.682) | (0.017) | (0.484) | (0.683) | (0.016) | (0.485) | (0.679) |
| $\boldsymbol{f(age_{i,t})\cdot Bull_{i,t}}$ | **0.0006** | **-0.0040** | **-0.0047** | **0.0137** | **-0.0430** | **-0.0409** | **0.0094** | **-0.0270** | **-0.0281** | **0.0186** | **-0.0570** | **-0.0567** |
| | (0.924) | (0.272) | (0.540) | (0.793) | (0.223) | (0.569) | (0.787) | (0.222) | (0.549) | (0.792) | (0.219) | (0.557) |
| $\boldsymbol{PPP_t}$ | **-0.5150*** | **0.2108** | **-0.6670** | **-0.4536*** | **0.2182** | **-0.6557** | **-0.5225*** | **0.2116** | **-0.6807** | **-0.4890*** | **0.2138** | **-0.6690** |
| | (0.079) | (0.595) | (0.158) | (0.061) | (0.565) | (0.151) | (0.059) | (0.583) | (0.142) | (0.058) | (0.575) | (0.145) |
| $\boldsymbol{STK_t}$ | **-0.4509** | **-0.1859** | **0.1233** | **-0.3428** | **-0.1678** | **0.1609** | **-0.4390** | **-0.1770** | **0.1189** | **-0.3893** | **-0.1709** | **0.1441** |
| | (0.271) | (0.452) | (0.705) | (0.269) | (0.382) | (0.542) | (0.233) | (0.402) | (0.681) | (0.247) | (0.388) | (0.597) |
| $R^2$ within | 0.2429 | 0.0107 | 0.0083 | 0.2461 | 0.0108 | 0.0085 | 0.2448 | 0.0108 | 0.0084 | 0.2455 | 0.0108 | 0.0084 |
| F-statistic | 9.1306 | 1.9139 | 1.5613 | 8.4894 | 1.7641 | 1.6007 | 8.6954 | 1.8157 | 1.5925 | 8.5385 | 1.7854 | 1.5756 |
| p-value | 0.0000 | 0.0189 | 0.0777 | 0.0000 | 0.0351 | 0.0669 | 0.0000 | 0.0284 | 0.0690 | 0.0000 | 0.0322 | 0.0736 |
| Funds | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 | 1918 |
| Observations | 45246 | 45246 | 45246 | 45246 | 45246 | 45246 | 45246 | 45246 | 45246 | 45246 | 45246 | 45246 |

Table J.G. Results for the UK equity funds sample. The PPB is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[2]{age_{i,t}}$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **1.2990*** ** | **0.6098** | **1.7156** ** | **1.2963** ** | **0.5856** | **1.8396** ** | **1.1730*** ** | **0.6631** | **1.7769** ** | **1.0595** ** | **0.7513** | **1.8475** ** |
| | (0.007) | (0.203) | (0.026) | (0.014) | (0.264) | (0.034) | (0.008) | (0.183) | (0.026) | (0.011) | (0.151) | (0.026) |
| $f(age_{i,t})$ | **0.0686*** | **-0.0188** | **0.0154** | **0.1681** | **-0.1606*** | **-0.1059** | **0.2522** | **-0.1370** | **-0.0104** | **0.3350** | **-0.2452*** | **-0.1062** |
| | (0.083) | (0.324) | (0.606) | (0.277) | (0.079) | (0.404) | (0.171) | (0.114) | (0.938) | (0.232) | (0.088) | (0.612) |
| $Bear_{i,t}$ | **-0.7674** ** | **0.1597** | **-0.5494** | **-0.8259** ** | **0.1527** | **-0.5170** | **-0.8087** ** | **0.1551** | **-0.5495** | **-0.8435** ** | **0.1523** | **-0.5335** |
| | (0.011) | (0.470) | (0.236) | (0.013) | (0.589) | (0.259) | (0.015) | (0.560) | (0.235) | (0.019) | (0.628) | (0.253) |
| $Bull_{i,t}$ | **1.2351*** ** | **-0.1463** | **0.0274** | **1.2919*** ** | **-0.1534** | **0.1541** | **1.2765*** ** | **-0.1465** | **0.1095** | **1.3266*** ** | **-0.1473** | **0.1986** |
| | (0.000) | (0.531) | (0.920) | (0.000) | (0.573) | (0.627) | (0.000) | (0.582) | (0.722) | (0.000) | (0.624) | (0.570) |
| $Size_{i,t-1}$ | **-0.0098** | **-0.0782** ** | **-0.1259** | **-0.1920** | **0.0148** | **-0.2332** | **-0.1489** ** | **-0.0377** | **-0.2171** | **-0.2120*** | **-0.0114** | **-0.2648** |
| | (0.905) | (0.022) | (0.231) | (0.139) | (0.799) | (0.239) | (0.038) | (0.386) | (0.145) | (0.099) | (0.852) | (0.196) |
| $Share_{i,t-1}$ | **0.0068** | **0.0016** | **0.0044** | **0.0117** | **-0.0028** | **0.0068** | **0.0109** | **-0.0008** | **0.0063** | **0.0107** | **-0.0016** | **0.0059** |
| | (0.421) | (0.847) | (0.718) | (0.198) | (0.714) | (0.596) | (0.175) | (0.924) | (0.612) | (0.207) | (0.839) | (0.637) |
| $ABIshare_{i,t-1}$ | **-0.0240** | **0.0077** | **-0.0054** | **-0.0215** | **0.0085** | **-0.0040** | **-0.0228** | **0.0086** | **-0.0043** | **-0.0217** | **0.0086** | **-0.0035** |
| | (0.198) | (0.459) | (0.761) | (0.234) | (0.410) | (0.824) | (0.221) | (0.406) | (0.811) | (0.234) | (0.403) | (0.844) |
| $p0\_5_{i,t}$ | **0.1618** | **0.0515** | **-0.0411** | **-0.5463*** | **-0.0511** | **-0.7469** | **-0.1576** | **-0.0832** | **-0.4842** | **-0.4835** | **-0.0875** | **-0.8341** |
| | (0.622) | (0.866) | (0.938) | (0.095) | (0.872) | (0.162) | (0.687) | (0.808) | (0.460) | (0.283) | (0.832) | (0.262) |
| $p5\_10_{i,t}$ | **0.1436** | **-0.1990** | **0.1681** | **-0.1908** | **-0.3597** | **-0.2474** | **0.0810** | **-0.3580** | **0.0192** | **-0.0668** | **-0.4257** | **-0.1309** |
| | (0.713) | (0.274) | (0.649) | (0.643) | (0.138) | (0.559) | (0.884) | (0.166) | (0.969) | (0.915) | (0.193) | (0.817) |
| $p10\_15_{i,t}$ | **0.0298** | **-0.3572** ** | **-0.3796** | **-0.1693** | **-0.6138*** ** | **-0.7911** ** | **0.0227** | **-0.6261*** ** | **-0.6505*** | **-0.0814** | **-0.8034*** ** | **-0.9158** ** |
| | (0.916) | (0.013) | (0.189) | (0.628) | (0.000) | (0.022) | (0.959) | (0.001) | (0.081) | (0.869) | (0.000) | (0.031) |
| $p15\_20_{i,t}$ | **0.1328** | **-0.0706** | **0.0729** | **0.1571** | **-0.1742** | **0.0441** | **0.2403** | **-0.1683** | **0.0943** | **0.2733** | **-0.2152** | **0.0955** |
| | (0.500) | (0.399) | (0.633) | (0.504) | (0.136) | (0.824) | (0.406) | (0.159) | (0.672) | (0.390) | (0.141) | (0.726) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.0290** | **-0.0575** | **-0.0240** | **0.1364** | **-0.0147** | **0.2010** | **0.0482** | **-0.0369** | **0.0806** | **0.1583** | **-0.0069** | **0.2864** |
| | (0.664) | (0.339) | (0.783) | (0.501) | (0.932) | (0.474) | (0.782) | (0.815) | (0.766) | (0.588) | (0.978) | (0.509) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0207** | **-0.0221** | **-0.0555** | **-0.0256** | **0.0548** | **-0.0825** | **-0.0430** | **0.0147** | **-0.1444** | **-0.0539** | **0.0830** | **-0.1357** |
| | (0.572) | (0.369) | (0.213) | (0.907) | (0.659) | (0.692) | (0.821) | (0.885) | (0.416) | (0.872) | (0.656) | (0.662) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0127** | **0.0304*** ** | **0.0373** ** | **-0.0233** | **0.2513*** ** | **0.2385*** | **-0.0300** | **0.1826*** ** | **0.1581** | **-0.0408** | **0.3604*** ** | **0.3329*** |
| | (0.410) | (0.001) | (0.034) | (0.878) | (0.000) | (0.063) | (0.801) | (0.000) | (0.106) | (0.855) | (0.000) | (0.073) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0062** | **0.0023** | **-0.0044** | **-0.1262** | **0.0612** | **-0.0659** | **-0.0916** | **0.0368** | **-0.0497** | **-0.1775** | **0.0824** | **-0.0882** |
| | (0.528) | (0.671) | (0.770) | (0.152) | (0.195) | (0.539) | (0.183) | (0.256) | (0.538) | (0.168) | (0.207) | (0.567) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0020** | **0.0026** ** | **0.0057*** ** | **0.0839** | **-0.0168** | **0.0767** | **0.0454** ** | **0.0016** | **0.0488*** | **0.1008** | **-0.0084** | **0.0985** |
| | (0.158) | (0.034) | (0.002) | (0.143) | (0.405) | (0.220) | (0.033) | (0.860) | (0.078) | (0.106) | (0.717) | (0.174) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0026** | **-0.0007** | **0.0068** | **0.0489** | **0.0037** | **0.0096** | **0.0268** | **0.0015** | **0.0206** | **0.0593** | **0.0036** | **0.0194** |
| | (0.692) | (0.917) | (0.389) | (0.423) | (0.960) | (0.908) | (0.505) | (0.975) | (0.687) | (0.465) | (0.971) | (0.859) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0055** | **-0.0008** | **-0.0040** | **-0.0528** | **0.0022** | **-0.0891** | **-0.0337** | **-0.0015** | **-0.0474** | **-0.0744** | **-0.0015** | **-0.1168** |
| | (0.499) | (0.892) | (0.687) | (0.519) | (0.971) | (0.312) | (0.523) | (0.969) | (0.417) | (0.499) | (0.985) | (0.326) |
| $PPP_t$ | **-1.0458** ** | **-0.2432** | **-1.0642*** | **-0.8346** ** | **-0.2572** | **-0.9542** | **-0.9331** ** | **-0.2342** | **-0.9957** | **-0.8724** ** | **-0.2477** | **-0.9693** |
| | (0.015) | (0.559) | (0.087) | (0.020) | (0.530) | (0.112) | (0.018) | (0.572) | (0.103) | (0.020) | (0.548) | (0.109) |
| $STK_t$ | **-0.4554** | **0.1782** | **0.2664** | **-0.2487** | **0.1785** | **0.3998** | **-0.3543** | **0.1996** | **0.3466** | **-0.2893** | **0.1892** | **0.3837** |
| | (0.202) | (0.393) | (0.526) | (0.371) | (0.298) | (0.263) | (0.280) | (0.296) | (0.367) | (0.335) | (0.292) | (0.297) |
| $R^2$ within | 0.2764 | 0.0152 | 0.0141 | 0.2760 | 0.0156 | 0.0139 | 0.2765 | 0.0154 | 0.0139 | 0.2760 | 0.0154 | 0.0139 |
| F-statistic | 6.8098 | 3.0822 | 2.4620 | 5.6220 | 3.3254 | 1.6291 | 5.9280 | 3.3806 | 2.1012 | 5.6968 | 3.4406 | 1.7816 |
| p-value | 0.0000 | 0.0001 | 0.0017 | 0.0000 | 0.0000 | 0.0599 | 0.0000 | 0.0000 | 0.0085 | 0.0000 | 0.0000 | 0.0327 |
| Funds | 1513 | 1513 | 1513 | 1513 | 1513 | 1513 | 1513 | 1513 | 1513 | 1513 | 1513 | 1513 |
| Observations | 34136 | 34136 | 34136 | 34136 | 34136 | 34136 | 34136 | 34136 | 34136 | 34136 | 34136 | 34136 |

## K. Results with the FTSE All Shares index as benchmark with the linear, logarithmic, and cubic root age functions (Chapter 3)

Table K1.A. Results for the equity fund samples with $f(age_{i,t}) = age_{i,t}$. The FTSE All Shares index is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | Emerging | | International | | UK | |
|---|---|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| ***Constant*** | **-0.3191** | **-0.4680** | **-0.2789** | **-0.5492** | **-1.2492** | **-1.7320*** | **0.4223** | **0.5510** |
| | (0.611) | (0.453) | (0.766) | (0.177) | (0.195) | (0.082) | (0.380) | (0.205) |
| $f(age_{i,t})$ | **0.0118** | **0.0093** | **0.1863** | **0.1752**** | **0.0443** | **0.0185** | **-0.0125** | **0.0096** |
| | (0.700) | (0.791) | (0.174) | (0.048) | (0.389) | (0.717) | (0.474) | (0.567) |
| $Bear_{i,t}$ | **-0.0161** | **0.5119** | **-3.3293***** | **-0.5636**** | **0.4916** | **1.1258*** | **-0.2137*** | **0.0043** |
| | (0.946) | (0.162) | (0.000) | (0.025) | (0.347) | (0.062) | (0.070) | (0.980) |
| $Bull_{i,t}$ | **0.2454** | **0.0627** | **0.0444** | **-0.1688** | **0.5368**** | **0.4038** | **-0.0490** | **-0.2582*** |
| | (0.114) | (0.745) | (0.895) | (0.688) | (0.048) | (0.124) | (0.646) | (0.075) |
| $Size_{i,t-1}$ | **0.0207** | **0.0004** | **0.2122**** | **0.1928***** | **0.0280** | **0.0282** | **-0.0200** | **-0.0418** |
| | (0.683) | (0.994) | (0.019) | (0.004) | (0.826) | (0.806) | (0.638) | (0.351) |
| $Share_{i,t-1}$ | **0.0073** | **-0.0087** | **0.0186** | **-0.0016** | **-0.0022** | **-0.0317** | **0.0153*** | **0.0084** |
| | (0.466) | (0.279) | (0.287) | (0.884) | (0.943) | (0.221) | (0.061) | (0.257) |
| $ABIshare_{i,t-1}$ | **0.0065** | **0.0069** | **-0.0651** | **-0.0768** | **0.0341*** | **0.0381**** | **-0.0001** | **0.0008** |
| | (0.571) | (0.523) | (0.373) | (0.181) | (0.082) | (0.039) | (0.994) | (0.921) |
| $p0\_5_{i,t}$ | **0.2630** | **0.5643*** | **3.4895***** | **3.3570***** | **0.7995** | **0.8931** | **-0.3586** | **0.1988** |
| | (0.510) | (0.098) | (0.006) | (0.000) | (0.249) | (0.169) | (0.138) | (0.324) |
| $p5\_10_{i,t}$ | **-0.1376** | **0.2730** | **-0.6006** | **1.2774** | **0.1230** | **0.4561** | **-0.2480** | **0.1117** |
| | (0.690) | (0.301) | (0.800) | (0.262) | (0.799) | (0.259) | (0.175) | (0.497) |
| $p10\_15_{i,t}$ | **-0.1366** | **-0.0491** | **-0.2060** | **0.8669*** | **0.1928** | **0.2384** | **-0.5117***** | **-0.4485***** |
| | (0.670) | (0.863) | (0.771) | (0.075) | (0.698) | (0.578) | (0.000) | (0.001) |
| $p15\_20_{i,t}$ | **-0.1403** | **-0.0009** | **-0.4512** | **0.5235** | **-0.1781** | **0.0368** | **-0.0895** | **-0.0168** |
| | (0.395) | (0.995) | (0.525) | (0.301) | (0.474) | (0.868) | (0.312) | (0.806) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.0473** | **-0.0045** | **-1.1329***** | **-0.4591**** | **-0.1113** | **-0.1363** | **0.1369** | **0.0311** |
| | (0.543) | (0.953) | (0.001) | (0.015) | (0.499) | (0.429) | (0.110) | (0.679) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0359** | **-0.0085** | **1.0443** | **0.5363*** | **0.0139** | **-0.0315** | **-0.0097** | **-0.0365** |
| | (0.247) | (0.804) | (0.140) | (0.069) | (0.804) | (0.560) | (0.785) | (0.352) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0181** | **0.0194** | **0.1649** | **0.0588** | **-0.0110** | **-0.0113** | **0.0431***** | **0.0534***** |
| | (0.497) | (0.461) | (0.107) | (0.505) | (0.815) | (0.787) | (0.003) | (0.000) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **0.0052** | **0.0020** | **-0.0419** | **-0.0678** | **0.0134** | **0.0035** | **0.0019** | **0.0038** |
| | (0.603) | (0.849) | (0.616) | (0.198) | (0.423) | (0.843) | (0.848) | (0.678) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0005** | **0.0012** | **-0.0141***** | **-0.0116***** | **0.0000** | **0.0013** | **0.0002** | **0.0016** |
| | (0.776) | (0.516) | (0.006) | (0.001) | (0.999) | (0.734) | (0.908) | (0.345) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0113** | **0.0101** | **0.1021***** | **0.0308** | **-0.0105** | **-0.0049** | **0.0138**** | **0.0087*** |
| | (0.338) | (0.253) | (0.001) | (0.143) | (0.505) | (0.734) | (0.019) | (0.090) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0023** | **-0.0009** | **-0.0133** | **-0.0219** | **-0.0088** | **-0.0121** | **-0.0003** | **0.0043** |
| | (0.759) | (0.913) | (0.642) | (0.319) | (0.505) | (0.323) | (0.948) | (0.525) |
| $PPP_t$ | **0.3102** | **0.5242** | | | **0.8601** | **1.3399** | **-0.1980** | **-0.2284** |
| | (0.594) | (0.381) | | | (0.337) | (0.164) | (0.608) | (0.520) |
| $STK_t$ | **-0.1129** | **-0.0569** | **0.4192** | **0.4332** | **-0.3825** | **-0.1087** | **0.1241** | **0.0145** |
| | (0.731) | (0.846) | (0.697) | (0.575) | (0.437) | (0.777) | (0.571) | (0.940) |
| $R^2$ within | 0.0140 | 0.0764 | 0.5592 | 0.3316 | 0.0358 | 0.1507 | 0.0208 | 0.0583 |
| F-statistic | 5.4983 | 11.3600 | 42402485.5 | 134334.034 | 10.5944 | 4.2066 | 15.0895 | 20.7716 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0003 | 0.0000 | 0.0000 |
| Funds | 3571 | 3571 | 183 | 183 | 1892 | 1892 | 1496 | 1496 |
| Observations | 20985 | 20985 | 713 | 713 | 11574 | 11574 | 8698 | 8698 |

Table K2.B. Results for the equity fund samples with $f(age_{i,t}) = age_{i,t}$. The FTSE All Shares index is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | Emerging | | International | | UK | |
|---|---|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| ***Constant*** | **-0.0065** | **-0.3950** | **0.9843** | **0.3443** | **-0.7931** | **-2.3727*** | **0.7469** | **1.9773**** |
| | (0.993) | (0.630) | (0.460) | (0.783) | (0.476) | (0.066) | (0.140) | (0.025) |
| $f(age_{i,t})$ | **-0.0064** | **0.0123** | **0.2068** | **0.0312** | **0.0093** | **0.0285** | **-0.0234** | **0.0120** |
| | (0.880) | (0.795) | (0.217) | (0.825) | (0.879) | (0.681) | (0.291) | (0.723) |
| $Bear_{i,t}$ | **-0.3041** | **0.0771** | **-3.9274***** | **-1.2866*** | **-0.0886** | **0.5199** | **-0.2686** | **-0.4655** |
| | (0.103) | (0.817) | (0.000) | (0.091) | (0.730) | (0.226) | (0.457) | (0.456) |
| $Bull_{i,t}$ | **0.0055** | **0.8827***** | **-0.4493** | **0.1290** | **0.1801** | **1.2813***** | **-0.2265** | **0.3093** |
| | (0.979) | (0.000) | (0.475) | (0.842) | (0.412) | (0.003) | (0.493) | (0.366) |
| $Size_{i,t-1}$ | **0.0070** | **0.0333** | **0.0433** | **-0.0337** | **0.0319** | **0.2302**** | **-0.0471** | **-0.2001*** |
| | (0.917) | (0.662) | (0.776) | (0.826) | (0.782) | (0.011) | (0.519) | (0.072) |
| $Share_{i,t-1}$ | **-0.0047** | **-0.0089** | **0.0014** | **-0.0617***** | **-0.0144** | **-0.0373** | **0.0025** | **0.0090** |
| | (0.708) | (0.544) | (0.949) | (0.004) | (0.754) | (0.380) | (0.802) | (0.530) |
| $ABIshare_{i,t-1}$ | **0.0004** | **0.0128** | **-0.0476** | **0.1120** | **0.0140** | **0.0793**** | **0.0001** | **-0.0183** |
| | (0.970) | (0.365) | (0.693) | (0.370) | (0.682) | (0.027) | (0.991) | (0.306) |
| $p0\_5_{i,t}$ | **0.4672** | **0.3058** | **3.7465**** | **6.1919***** | **0.5717** | **0.1367** | **0.0042** | **-0.2611** |
| | (0.173) | (0.583) | (0.015) | (0.000) | (0.216) | (0.850) | (0.987) | (0.691) |
| $p5\_10_{i,t}$ | **-0.1350** | **0.5795** | **-0.2442** | **2.1285** | **0.0016** | **0.9235*** | **-0.1366** | **0.0626** |
| | (0.717) | (0.188) | (0.914) | (0.235) | (0.997) | (0.088) | (0.529) | (0.871) |
| $p10\_15_{i,t}$ | **0.0834** | **0.2181** | **0.7425** | **1.6869** | **0.4409** | **0.7488** | **-0.3934**** | **-0.5499*** |
| | (0.824) | (0.601) | (0.613) | (0.183) | (0.405) | (0.169) | (0.028) | (0.076) |
| $p15\_20_{i,t}$ | **-0.0396** | **0.2493** | **-0.3392** | **0.2615** | **-0.0081** | **0.4710** | **-0.0849** | **0.0154** |
| | (0.856) | (0.286) | (0.738) | (0.716) | (0.980) | (0.165) | (0.468) | (0.927) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **-0.0863** | **0.0334** | **-1.0547***** | **-1.2882**** | **-0.1425** | **0.1242** | **-0.0379** | **-0.0478** |
| | (0.292) | (0.780) | (0.004) | (0.012) | (0.245) | (0.485) | (0.630) | (0.695) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0100** | **-0.0625** | **0.7221** | **0.6360** | **-0.0138** | **-0.1060** | **-0.0304** | **-0.0679** |
| | (0.768) | (0.137) | (0.363) | (0.330) | (0.794) | (0.100) | (0.255) | (0.206) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.0099** | **-0.0055** | **0.0972** | **0.2366** | **-0.0552** | **-0.0590** | **0.0342***** | **0.0431**** |
| | (0.724) | (0.856) | (0.594) | (0.105) | (0.250) | (0.242) | (0.003) | (0.032) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0033** | **-0.0209** | **-0.0037** | **0.0458** | **-0.0084** | **-0.0352** | **0.0039** | **-0.0068** |
| | (0.778) | (0.129) | (0.975) | (0.630) | (0.677) | (0.142) | (0.573) | (0.700) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0001** | **0.0011** | **-0.0104** | **-0.0064** | **-0.0001** | **-0.0057**** | **0.0013** | **0.0087***** |
| | (0.954) | (0.587) | (0.178) | (0.253) | (0.984) | (0.018) | (0.618) | (0.000) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0094** | **0.0181*** | **0.0576*** | **0.0409** | **-0.0084** | **0.0188** | **0.0156** | **0.0038** |
| | (0.378) | (0.063) | (0.073) | (0.197) | (0.472) | (0.185) | (0.136) | (0.707) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **0.0066** | **-0.0006** | **0.0502** | **0.0386** | **0.0088** | **0.0011** | **0.0016** | **-0.0144** |
| | (0.378) | (0.952) | (0.126) | (0.154) | (0.311) | (0.933) | (0.850) | (0.340) |
| $PPP_t$ | **0.3083** | **-0.1857** | | | **0.9061** | **0.6183** | **-0.2659** | **-1.1994*** |
| | (0.605) | (0.766) | | | (0.296) | (0.511) | (0.541) | (0.070) |
| $STK_t$ | **0.0660** | **0.2069** | **0.3006** | **1.4348** | **-0.1151** | **0.1099** | **0.2188** | **0.3373** |
| | (0.896) | (0.708) | (0.837) | (0.250) | (0.878) | (0.893) | (0.356) | (0.455) |
| $R^2$ within | 0.0047 | 0.0179 | 0.2656 | 0.0612 | 0.0081 | 0.0333 | 0.0096 | 0.0167 |
| F-statistic | 1.8603 | 3.0151 | 8.0506 | 5.2448 | 0.9655 | 3.0715 | 3.2948 | 2.7329 |
| p-value | 0.0236 | 0.0001 | 0.0000 | 0.0000 | 0.5060 | 0.0001 | 0.0000 | 0.0005 |
| Funds | 3617 | 3617 | 186 | 186 | 1918 | 1918 | 1513 | 1513 |
| Observations | 82149 | 82149 | 2767 | 2767 | 45246 | 45246 | 34136 | 34136 |

Table K2.A. Results for the equity fund samples with $f(age_{i,t}) = \ln(age_{i,t} + 1)$. The FTSE All Shares index is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | Emerging | | International | | UK | |
|---|---|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| $\boldsymbol{Constant}$ | **-0.3624** | **-0.4185** | **-0.2791** | **-0.9823** | **-1.4549** | **-1.7872*** | **0.4924** | **0.5998** |
| | (0.560) | (0.499) | (0.762) | (0.144) | (0.149) | (0.082) | (0.306) | (0.181) |
| $\boldsymbol{f(age_{i,t})}$ | **0.1286** | **0.0534** | **1.0164*** | **1.0010**** | **0.3791** | **0.1929** | **-0.0885** | **-0.0408** |
| | (0.446) | (0.790) | (0.091) | (0.025) | (0.194) | (0.522) | (0.417) | (0.756) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.0674** | **0.4472** | **-4.0087***** | **-0.6363** | **0.6916** | **1.2172*** | **-0.3143*** | **-0.0646** |
| | (0.781) | (0.275) | (0.000) | (0.199) | (0.166) | (0.056) | (0.072) | (0.815) |
| $\boldsymbol{Bull_{i,t}}$ | **0.3267** | **0.0939** | **0.6319** | **0.4455** | **0.7554**** | **0.5666** | **-0.0498** | **-0.2975** |
| | (0.180) | (0.751) | (0.342) | (0.528) | (0.048) | (0.129) | (0.785) | (0.231) |
| $\boldsymbol{Size_{i,t-1}}$ | **-0.0286** | **-0.0818** | **-0.1876** | **0.0153** | **-0.1014** | **-0.0921** | **-0.0019** | **-0.0810** |
| | (0.810) | (0.499) | (0.426) | (0.902) | (0.698) | (0.676) | (0.968) | (0.189) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0089** | **-0.0060** | **0.0286** | **0.0022** | **0.0075** | **-0.0220** | **0.0147*** | **0.0087** |
| | (0.430) | (0.513) | (0.184) | (0.860) | (0.836) | (0.450) | (0.076) | (0.214) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0034** | **0.0044** | **-0.0492** | **-0.0681** | **0.0220** | **0.0305*** | **0.0000** | **0.0006** |
| | (0.776) | (0.722) | (0.420) | (0.166) | (0.264) | (0.081) | (0.997) | (0.932) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.1979** | **0.5661** | **3.7681***** | **3.2887***** | **0.8852** | **1.1335** | **-0.6248*** | **-0.0393** |
| | (0.675) | (0.161) | (0.001) | (0.000) | (0.296) | (0.147) | (0.053) | (0.889) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.2113** | **0.2763** | **-2.3272** | **0.5083** | **0.1841** | **0.6315** | **-0.3156** | **0.1008** |
| | (0.621) | (0.443) | (0.427) | (0.705) | (0.788) | (0.305) | (0.280) | (0.696) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.2533** | **-0.2224** | **-0.3578** | **0.5468** | **0.2411** | **0.2642** | **-0.8262***** | **-0.7903***** |
| | (0.553) | (0.607) | (0.487) | (0.371) | (0.727) | (0.683) | (0.000) | (0.000) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.0717** | **0.0636** | **-0.1221** | **0.9922** | **-0.0650** | **0.1727** | **-0.1615** | **-0.0752** |
| | (0.768) | (0.792) | (0.880) | (0.124) | (0.862) | (0.659) | (0.359) | (0.578) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.1691** | **-0.0435** | **-3.1832***** | **-1.3723**** | **-0.3215** | **-0.4371** | **0.5485**** | **0.1180** |
| | (0.498) | (0.869) | (0.000) | (0.012) | (0.517) | (0.405) | (0.038) | (0.603) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **0.1595** | **-0.0413** | **3.0086** | **1.3044** | **-0.0145** | **-0.1724** | **0.0473** | **-0.1712** |
| | (0.318) | (0.813) | (0.170) | (0.166) | (0.962) | (0.533) | (0.804) | (0.413) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **0.1259** | **0.1477** | **0.1599** | **0.0607** | **-0.0825** | **-0.0402** | **0.3390***** | **0.3310***** |
| | (0.444) | (0.376) | (0.734) | (0.888) | (0.758) | (0.872) | (0.001) | (0.001) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **-0.0132** | **-0.0310** | **-0.4430** | **-0.5939*** | **-0.0138** | **-0.0498** | **0.0491** | **0.0220** |
| | (0.896) | (0.740) | (0.396) | (0.084) | (0.927) | (0.738) | (0.592) | (0.786) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **0.0123** | **0.0350** | **0.0912** | **0.0218** | **0.0419** | **0.0452** | **-0.0053** | **0.0262** |
| | (0.734) | (0.342) | (0.313) | (0.660) | (0.581) | (0.479) | (0.691) | (0.142) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.0745** | **0.0752** | **0.8153***** | **0.1928** | **-0.1489** | **-0.0686** | **0.1112**** | **0.0695** |
| | (0.555) | (0.440) | (0.005) | (0.372) | (0.370) | (0.634) | (0.040) | (0.388) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **-0.0504** | **-0.0177** | **-0.3571** | **-0.4060** | **-0.1456** | **-0.1313** | **-0.0016** | **0.0397** |
| | (0.560) | (0.849) | (0.209) | (0.118) | (0.250) | (0.270) | (0.981) | (0.656) |
| $\boldsymbol{PPP_t}$ | **0.2974** | **0.5348** | | | **0.8438** | **1.3174** | **-0.2138** | **-0.1679** |
| | (0.588) | (0.335) | | | (0.329) | (0.158) | (0.581) | (0.641) |
| $\boldsymbol{STK_t}$ | **-0.0957** | **-0.0248** | **0.5840** | **0.5579** | **-0.2937** | **-0.0830** | **0.1084** | **0.0804** |
| | (0.726) | (0.912) | (0.503) | (0.374) | (0.456) | (0.773) | (0.523) | (0.624) |
| $R^2$ within | 0.0152 | 0.0773 | 0.5702 | 0.3430 | 0.0378 | 0.1519 | 0.0216 | 0.0573 |
| F-statistic | 9.2683 | 19.5804 | 2852.9662 | 3812.6622 | 10.3674 | 3.8840 | 34.1293 | 26.4229 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0006 | 0.0000 | 0.0000 |
| Funds | 3571 | 3571 | 183 | 183 | 1892 | 1892 | 1496 | 1496 |
| Observations | 20985 | 20985 | 713 | 713 | 11574 | 11574 | 8698 | 8698 |

Table K2.B. Results for the equity fund samples with $f(age_{i,t}) = \ln(age_{i,t} + 1)$. The FTSE All Shares index is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | Emerging | | International | | UK | |
|---|---|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| ***Constant*** | **-0.0554** | **-0.2915** | **-0.0204** | **-0.6262** | **-0.8337** | **-2.3820*** | **0.7251** | **2.0747**** |
| | (0.937) | (0.714) | (0.987) | (0.649) | (0.438) | (0.055) | (0.169) | (0.040) |
| $f(age_{i,t})$ | **-0.0690** | **-0.0155** | **0.5992** | **0.0135** | **0.0081** | **0.2410** | **-0.1752** | **-0.1850** |
| | (0.690) | (0.933) | (0.370) | (0.979) | (0.972) | (0.335) | (0.217) | (0.281) |
| $Bear_{i,t}$ | **-0.3858** | **-0.0749** | **-4.2669***** | **-1.5010*** | **-0.0617** | **0.2937** | **-0.3190** | **-0.4186** |
| | (0.114) | (0.837) | (0.000) | (0.057) | (0.817) | (0.549) | (0.438) | (0.518) |
| $Bull_{i,t}$ | **-0.1038** | **0.8396***** | **-0.6228** | **-0.0531** | **-0.0091** | **1.1301**** | **-0.1934** | **0.5039** |
| | (0.659) | (0.000) | (0.413) | (0.939) | (0.967) | (0.011) | (0.591) | (0.228) |
| $Size_{i,t-1}$ | **0.0858** | **-0.0265** | **0.2927** | **0.4134** | **0.0883** | **0.1405** | **0.0531** | **-0.2704** |
| | (0.349) | (0.843) | (0.402) | (0.334) | (0.558) | (0.314) | (0.504) | (0.294) |
| $Share_{i,t-1}$ | **-0.0078** | **-0.0070** | **-0.0099** | **-0.0773***** | **-0.0194** | **-0.0262** | **-0.0025** | **0.0092** |
| | (0.526) | (0.566) | (0.721) | (0.003) | (0.681) | (0.536) | (0.789) | (0.533) |
| $ABIshare_{i,t-1}$ | **0.0015** | **0.0125** | **-0.0026** | **0.1288** | **0.0143** | **0.0743**** | **0.0011** | **-0.0163** |
| | (0.904) | (0.393) | (0.982) | (0.272) | (0.678) | (0.042) | (0.922) | (0.362) |
| $p0\_5_{i,t}$ | **0.5236** | **0.0289** | **4.0152**** | **7.2801***** | **0.7444** | **0.2954** | **-0.1436** | **-1.1233** |
| | (0.290) | (0.967) | (0.012) | (0.000) | (0.297) | (0.773) | (0.661) | (0.107) |
| $p5\_10_{i,t}$ | **-0.3430** | **0.4555** | **-1.9636** | **1.3343** | **-0.1412** | **1.3545*** | **-0.2539** | **-0.4985** |
| | (0.510) | (0.391) | (0.436) | (0.529) | (0.826) | (0.057) | (0.466) | (0.269) |
| $p10\_15_{i,t}$ | **0.0043** | **0.0903** | **0.6635** | **1.6386** | **0.5061** | **1.1824*** | **-0.6706**** | **-1.1382***** |
| | (0.993) | (0.862) | (0.718) | (0.277) | (0.460) | (0.091) | (0.015) | (0.003) |
| $p15\_20_{i,t}$ | **-0.0079** | **0.3976** | **-0.5016** | **0.0511** | **0.0999** | **0.8544*** | **-0.2129** | **-0.0554** |
| | (0.977) | (0.179) | (0.721) | (0.959) | (0.801) | (0.053) | (0.217) | (0.805) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **-0.2170** | **0.2090** | **-2.5036**** | **-2.9002**** | **-0.4620** | **0.2510** | **0.0662** | **0.2352** |
| | (0.324) | (0.580) | (0.014) | (0.030) | (0.179) | (0.655) | (0.751) | (0.558) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.1634** | **-0.1619** | **2.4439** | **2.2099** | **0.0233** | **-0.5366** | **0.0052** | **-0.0541** |
| | (0.416) | (0.496) | (0.208) | (0.197) | (0.937) | (0.149) | (0.973) | (0.817) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.0016** | **0.0021** | **-0.0375** | **0.8278** | **-0.2565** | **-0.4194** | **0.2810***** | **0.3330**** |
| | (0.993) | (0.991) | (0.964) | (0.246) | (0.327) | (0.150) | (0.007) | (0.028) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0358** | **-0.1833*** | **-0.0864** | **0.3209** | **-0.1026** | **-0.3201*** | **0.0836** | **-0.0683** |
| | (0.748) | (0.099) | (0.913) | (0.620) | (0.529) | (0.071) | (0.154) | (0.571) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **-0.0265** | **0.0284** | **-0.1159** | **-0.1850** | **-0.0190** | **-0.0063** | **-0.0248** | **0.0823** |
| | (0.451) | (0.553) | (0.352) | (0.211) | (0.653) | (0.886) | (0.391) | (0.286) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.0835** | **0.1604**** | **0.4605*** | **0.3022** | **-0.0500** | **0.2042** | **0.0903** | **-0.0082** |
| | (0.383) | (0.044) | (0.079) | (0.176) | (0.641) | (0.100) | (0.243) | (0.920) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **0.0888** | **0.0248** | **0.2836** | **0.2584** | **0.1420*** | **0.0919** | **-0.0134** | **-0.1676** |
| | (0.167) | (0.785) | (0.319) | (0.237) | (0.056) | (0.398) | (0.842) | (0.179) |
| $PPP_t$ | **0.3009** | **-0.1504** | | | **0.9074** | **0.6008** | **-0.2841** | **-1.0753*** |
| | (0.586) | (0.793) | | | (0.271) | (0.501) | (0.504) | (0.091) |
| $STK_t$ | **0.0784** | **0.2683** | **0.7586** | **1.5160** | **-0.0732** | **0.1072** | **0.2120** | **0.4968** |
| | (0.846) | (0.543) | (0.526) | (0.139) | (0.900) | (0.865) | (0.299) | (0.202) |
| $R^2$ within | 0.0050 | 0.0179 | 0.2652 | 0.0628 | 0.0085 | 0.0335 | 0.0102 | 0.0165 |
| F-statistic | 1.4747 | 3.3145 | 6.9174 | 6.5537 | 1.0142 | 2.3114 | 3.1184 | 2.0629 |
| p-value | 0.1071 | 0.0000 | 0.0000 | 0.0000 | 0.4504 | 0.0034 | 0.0001 | 0.0100 |
| Funds | 3617 | 3617 | 186 | 186 | 1918 | 1918 | 1513 | 1513 |
| Observations | 82149 | 82149 | 2767 | 2767 | 45246 | 45246 | 34136 | 34136 |

Table K3.A. Results for the equity fund samples with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$. The FTSE All Shares index is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | Emerging | | International | | UK | |
|---|---|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| ***Constant*** | **-0.4561** | **-0.4893** | **-1.2229** | **-1.8032**** | **-1.7363*** | **-1.9474*** | **0.5536** | **0.5931** |
| | (0.463) | (0.440) | (0.237) | (0.037) | (0.096) | (0.071) | (0.273) | (0.213) |
| $f(age_{i,t})$ | **0.1942** | **0.0958** | **1.5624*** | **1.4897**** | **0.5595** | **0.2776** | **-0.1211** | **-0.0208** |
| | (0.467) | (0.758) | (0.091) | (0.024) | (0.224) | (0.555) | (0.448) | (0.909) |
| $Bear_{i,t}$ | **-0.1249** | **0.4000** | **-4.4638***** | **-0.7375** | **0.7580** | **1.2535*** | **-0.3898*** | **-0.1071** |
| | (0.642) | (0.352) | (0.000) | (0.233) | (0.148) | (0.061) | (0.057) | (0.727) |
| $Bull_{i,t}$ | **0.3394** | **0.0959** | **0.7181** | **0.5936** | **0.8006*** | **0.6252** | **-0.0437** | **-0.3177** |
| | (0.225) | (0.775) | (0.352) | (0.463) | (0.068) | (0.136) | (0.836) | (0.271) |
| $Size_{i,t-1}$ | **-0.0321** | **-0.0862** | **-0.1089** | **0.0846** | **-0.1068** | **-0.0867** | **-0.0082** | **-0.0979** |
| | (0.813) | (0.536) | (0.706) | (0.559) | (0.718) | (0.731) | (0.900) | (0.201) |
| $Share_{i,t-1}$ | **0.0087** | **-0.0067** | **0.0247** | **-0.0001** | **0.0060** | **-0.0245** | **0.0150*** | **0.0087** |
| | (0.435) | (0.466) | (0.242) | (0.994) | (0.866) | (0.391) | (0.073) | (0.226) |
| $ABIshare_{i,t-1}$ | **0.0038** | **0.0048** | **-0.0583** | **-0.0740** | **0.0240** | **0.0325*** | **0.0000** | **0.0005** |
| | (0.754) | (0.697) | (0.365) | (0.145) | (0.213) | (0.061) | (0.996) | (0.943) |
| $p0\_5_{i,t}$ | **0.0631** | **0.6398** | **6.5512***** | **4.6034***** | **1.2023** | **1.5185** | **-1.0960**** | **-0.0636** |
| | (0.924) | (0.313) | (0.000) | (0.000) | (0.345) | (0.230) | (0.032) | (0.884) |
| $p5\_10_{i,t}$ | **-0.3335** | **0.3276** | **-4.8036** | **-0.5400** | **0.2134** | **0.7703** | **-0.3509** | **0.2712** |
| | (0.532) | (0.494) | (0.318) | (0.797) | (0.812) | (0.350) | (0.410) | (0.516) |
| $p10\_15_{i,t}$ | **-0.3243** | **-0.3030** | **-0.4649** | **0.5570** | **0.3416** | **0.3104** | **-1.0549***** | **-0.9987***** |
| | (0.552) | (0.583) | (0.563) | (0.551) | (0.700) | (0.709) | (0.000) | (0.000) |
| $p15\_20_{i,t}$ | **-0.0823** | **0.0672** | **0.1223** | **1.3468** | **-0.0911** | **0.1653** | **-0.1789** | **-0.0709** |
| | (0.783) | (0.820) | (0.914) | (0.116) | (0.841) | (0.725) | (0.437) | (0.701) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.2760** | **-0.0742** | **-4.6430***** | **-2.0560***** | **-0.4930** | **-0.6774** | **0.8520**** | **0.1531** |
| | (0.485) | (0.862) | (0.000) | (0.010) | (0.534) | (0.418) | (0.040) | (0.664) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.2505** | **-0.0619** | **4.7827** | **2.0924** | **-0.0076** | **-0.2549** | **0.0674** | **-0.2642** |
| | (0.289) | (0.809) | (0.165) | (0.155) | (0.987) | (0.532) | (0.813) | (0.401) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.1814** | **0.2084** | **0.3647** | **0.1439** | **-0.1239** | **-0.0630** | **0.4809***** | **0.4723***** |
| | (0.452) | (0.388) | (0.614) | (0.823) | (0.756) | (0.863) | (0.001) | (0.001) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0034** | **-0.0302** | **-0.5512** | **-0.7893** | **0.0096** | **-0.0454** | **0.0607** | **0.0262** |
| | (0.980) | (0.813) | (0.467) | (0.103) | (0.963) | (0.821) | (0.629) | (0.816) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0148** | **0.0410** | **0.0640** | **-0.0087** | **0.0487** | **0.0493** | **-0.0038** | **0.0353** |
| | (0.750) | (0.392) | (0.593) | (0.889) | (0.620) | (0.553) | (0.857) | (0.157) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **0.1093** | **0.1045** | **1.0854***** | **0.2483** | **-0.1911** | **-0.0910** | **0.1573**** | **0.0962** |
| | (0.514) | (0.413) | (0.006) | (0.405) | (0.385) | (0.636) | (0.031) | (0.343) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0597** | **-0.0203** | **-0.4306** | **-0.5107** | **-0.1779** | **-0.1700** | **-0.0046** | **0.0520** |
| | (0.598) | (0.868) | (0.249) | (0.133) | (0.297) | (0.288) | (0.956) | (0.650) |
| $PPP_t$ | **0.2882** | **0.5259** | | | **0.8285** | **1.3128** | **-0.2123** | **-0.1794** |
| | (0.605) | (0.352) | | | (0.344) | (0.164) | (0.583) | (0.618) |
| $STK_t$ | **-0.1096** | **-0.0374** | **0.5292** | **0.5266** | **-0.3275** | **-0.0979** | **0.1103** | **0.0677** |
| | (0.700) | (0.875) | (0.559) | (0.413) | (0.428) | (0.750) | (0.539) | (0.690) |
| $R^2$ within | 0.0152 | 0.0771 | 0.5667 | 0.3389 | 0.0376 | 0.1515 | 0.0217 | 0.0575 |
| F-statistic | 7.4518 | 18.8468 | 21455.5117 | 2803.4231 | 11.9275 | 4.0058 | 26.9443 | 26.2938 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0005 | 0.0000 | 0.0000 |
| Funds | 3571 | 3571 | 183 | 183 | 1892 | 1892 | 1496 | 1496 |
| Observations | 20985 | 20985 | 713 | 713 | 11574 | 11574 | 8698 | 8698 |

Table K3.B. Results for the equity fund samples with $f(age_{i,t}) = \sqrt[3]{age_{i,t}}$. The FTSE All Shares index is the benchmark. The panel observations have a quarterly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| Sample | Equity | | Emerging | | International | | UK | |
|---|---|---|---|---|---|---|---|---|
| Dependent | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE | $R_{Fund}$-$R_{FTSE}$ | M2-FTSE |
| $\boldsymbol{Constant}$ | **0.0272** | **-0.3389** | **-0.3580** | **-0.4508** | **-0.8288** | **-2.6245**** | **0.8993*** | **2.1567**** |
| | (0.968) | (0.642) | (0.798) | (0.739) | (0.426) | (0.029) | (0.077) | (0.025) |
| $\boldsymbol{f(age_{i,t})}$ | **-0.1109** | **0.0054** | **0.8624** | **-0.1171** | **0.0055** | **0.3525** | **-0.2715** | **-0.2145** |
| | (0.704) | (0.986) | (0.415) | (0.884) | (0.989) | (0.398) | (0.222) | (0.419) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.4393** | **-0.1701** | **-4.5632***** | **-1.7216**** | **-0.0219** | **0.1847** | **-0.3962** | **-0.4217** |
| | (0.129) | (0.662) | (0.000) | (0.043) | (0.940) | (0.724) | (0.387) | (0.535) |
| $\boldsymbol{Bull_{i,t}}$ | **-0.1431** | **0.8380***** | **-0.8298** | **-0.2440** | **-0.0680** | **1.1001**** | **-0.1909** | **0.6046** |
| | (0.581) | (0.001) | (0.348) | (0.755) | (0.773) | (0.020) | (0.631) | (0.207) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0832** | **-0.0216** | **0.3378** | **0.5101** | **0.0944** | **0.2055** | **0.0381** | **-0.3284** |
| | (0.403) | (0.875) | (0.368) | (0.278) | (0.586) | (0.182) | (0.657) | (0.212) |
| $\boldsymbol{Share_{i,t-1}}$ | **-0.0071** | **-0.0078** | **-0.0089** | **-0.0763***** | **-0.0191** | **-0.0305** | **-0.0014** | **0.0091** |
| | (0.566) | (0.539) | (0.735) | (0.002) | (0.687) | (0.476) | (0.879) | (0.528) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0013** | **0.0128** | **-0.0067** | **0.1285** | **0.0141** | **0.0766**** | **0.0012** | **-0.0158** |
| | (0.918) | (0.380) | (0.953) | (0.277) | (0.686) | (0.037) | (0.910) | (0.376) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.6484** | **-0.1289** | **5.7328***** | **8.9970***** | **1.0750** | **0.0449** | **-0.2475** | **-1.2379** |
| | (0.233) | (0.886) | (0.002) | (0.000) | (0.183) | (0.973) | (0.565) | (0.205) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.4961** | **0.5890** | **-4.1259** | **-0.8438** | **-0.1756** | **1.7089*** | **-0.2829** | **-0.3793** |
| | (0.441) | (0.380) | (0.273) | (0.793) | (0.824) | (0.066) | (0.541) | (0.526) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.0007** | **0.1143** | **0.4877** | **0.7064** | **0.6934** | **1.4503*** | **-0.8802**** | **-1.3052***** |
| | (0.999) | (0.856) | (0.830) | (0.709) | (0.406) | (0.094) | (0.011) | (0.005) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.0040** | **0.5142** | **-0.4907** | **-0.2849** | **0.1358** | **1.0396**** | **-0.2633** | **0.0039** |
| | (0.990) | (0.145) | (0.795) | (0.835) | (0.774) | (0.048) | (0.217) | (0.990) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **-0.3049** | **0.3266** | **-3.4750**** | **-3.9055**** | **-0.6801** | **0.4165** | **0.1175** | **0.3347** |
| | (0.358) | (0.567) | (0.018) | (0.038) | (0.198) | (0.628) | (0.703) | (0.583) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **0.2531** | **-0.2366** | **3.8624** | **3.5601** | **0.0409** | **-0.7598** | **0.0088** | **-0.1111** |
| | (0.401) | (0.504) | (0.172) | (0.156) | (0.926) | (0.172) | (0.969) | (0.751) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **-0.0034** | **-0.0048** | **0.0705** | **1.3416** | **-0.3758** | **-0.5890** | **0.4010***** | **0.4547**** |
| | (0.989) | (0.986) | (0.954) | (0.206) | (0.338) | (0.173) | (0.006) | (0.032) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **-0.0421** | **-0.2520** | **-0.0996** | **0.4810** | **-0.1287** | **-0.4369*** | **0.1100** | **-0.0947** |
| | (0.786) | (0.105) | (0.930) | (0.605) | (0.576) | (0.081) | (0.181) | (0.586) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **-0.0287** | **0.0299** | **-0.1504** | **-0.2456** | **-0.0235** | **-0.0318** | **-0.0222** | **0.1150** |
| | (0.474) | (0.576) | (0.311) | (0.174) | (0.658) | (0.548) | (0.489) | (0.196) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.1163** | **0.2185**** | **0.6404*** | **0.4372** | **-0.0737** | **0.2706** | **0.1370** | **-0.0069** |
| | (0.376) | (0.043) | (0.078) | (0.158) | (0.610) | (0.106) | (0.209) | (0.949) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **0.1133** | **0.0255** | **0.4104** | **0.3751** | **0.1789*** | **0.1103** | **-0.0150** | **-0.2298** |
| | (0.198) | (0.838) | (0.306) | (0.223) | (0.080) | (0.463) | (0.872) | (0.181) |
| $\boldsymbol{PPP_t}$ | **0.3056** | **-0.1606** | | | **0.9102** | **0.5922** | **-0.2727** | **-1.0880*** |
| | (0.585) | (0.782) | | | (0.272) | (0.511) | (0.525) | (0.090) |
| $\boldsymbol{STK_t}$ | **0.0853** | **0.2607** | **0.7421** | **1.5700** | **-0.0706** | **0.0985** | **0.2252** | **0.4824** |
| | (0.839) | (0.568) | (0.546) | (0.134) | (0.907) | (0.880) | (0.294) | (0.225) |
| $R^2$ within | 0.0049 | 0.0179 | 0.2653 | 0.0631 | 0.0084 | 0.0334 | 0.0100 | 0.0165 |
| F-statistic | 1.4683 | 3.2634 | 7.0337 | 6.3757 | 0.9543 | 2.3322 | 3.4366 | 2.0935 |
| p-value | 0.1097 | 0.0000 | 0.0000 | 0.0000 | 0.5190 | 0.0031 | 0.0000 | 0.0088 |
| Funds | 3617 | 3617 | 186 | 186 | 1918 | 1918 | 1513 | 1513 |
| Observations | 82149 | 82149 | 2767 | 2767 | 45246 | 45246 | 34136 | 34136 |

## L. Tables 4.3.A – 4.3.G and 4.4.A – 4.4.G (Chapter 4)

Table 4.3.A. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Internally managed all funds sample.

**All Funds (internal)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9339 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9791 | 0.9869 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9602 | 0.9966 | 0.9968 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0135 | -0.0293 | -0.0225 | -0.0260 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0504 | 0.0673 | 0.0610 | 0.0642 | **-0.4449** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.1692 | 0.1555 | 0.1640 | 0.1607 | 0.0083 | 0.0244 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0430 | -0.0316 | -0.0380 | -0.0344 | -0.0233 | -0.0412 | 0.1592 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.0527 | -0.0423 | -0.0490 | -0.0453 | 0.0255 | 0.0156 | -0.2408 | 0.1632 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1634 | -0.2073 | -0.1910 | -0.1993 | -0.0183 | -0.0407 | -0.1609 | -0.0514 | 0.1275 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1512 | -0.1357 | -0.1458 | -0.1414 | -0.0209 | -0.0271 | -0.2122 | -0.0361 | 0.1055 | -0.0391 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.1170 | -0.0774 | -0.0963 | -0.0876 | 0.0097 | -0.0402 | -0.2236 | -0.0188 | 0.0699 | -0.0526 | -0.0742 | 1 | | | |
| $p15\_20_{i,t}$ | -0.0571 | -0.0230 | -0.0375 | -0.0308 | 0.0344 | -0.0131 | -0.2104 | -0.0151 | 0.0360 | -0.0659 | -0.0931 | -0.1253 | 1 | | |
| $PPP_t$ | 0.1618 | 0.1825 | 0.1767 | 0.1797 | 0.0146 | 0.0937 | 0.1500 | -0.0395 | -0.0467 | -0.3314 | -0.2165 | -0.0999 | -0.0087 | 1 | |
| $STK_t$ | 0.1839 | 0.1196 | 0.1492 | 0.1360 | 0.1130 | -0.0002 | 0.3671 | -0.0381 | -0.0327 | -0.1944 | -0.2691 | -0.2245 | -0.2096 | 0.2695 | 1 |

Table 4.3.B. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Internally managed allocation funds sample. Note: there are no common observations for the lag of ABI's share and $PPP_t$.

**Allocation Funds (internal)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9454 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9810 | 0.9906 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9644 | 0.9979 | 0.9973 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | 0.0796 | 0.0576 | 0.0673 | 0.0629 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | -0.0514 | -0.0459 | -0.0481 | -0.0481 | **-0.4805** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.2244 | 0.3120 | 0.2806 | 0.2972 | -0.1392 | 0.1448 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0338 | 0.0151 | -0.0041 | 0.0056 | -0.1140 | 0.1683 | **0.4337** | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | 0.1838 | 0.1374 | 0.1558 | 0.1478 | 0.1116 | -0.1337 | **-0.5076** | -0.3245 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1287 | -0.1404 | -0.1377 | -0.1390 | 0.0171 | -0.1020 | -0.2984 | -0.1470 | **0.4527** | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.0321 | 0.0105 | -0.0076 | 0.0015 | 0.0171 | 0.0132 | -0.3026 | -0.1687 | 0.3278 | -0.0205 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0941 | -0.0958 | -0.0961 | -0.0955 | 0.1574 | -0.1274 | -0.4368 | -0.2585 | 0.1024 | -0.0375 | -0.0375 | 1 | | | |
| $p15\_20_{i,t}$ | 0.0479 | -0.0341 | -0.0008 | -0.0180 | 0.2126 | -0.1377 | -0.2022 | -0.1837 | 0.3286 | -0.0322 | -0.0322 | -0.0590 | 1 | | |
| $PPP_t$ | 0.0816 | 0.1232 | 0.1066 | 0.1164 | 0.0274 | 0.0708 | 0.1399 | 0.1088 | | **-0.4436** | 0.0091 | 0.0166 | 0.0143 | 1 | |
| $STK_t$ | 0.0839 | 0.0682 | 0.0752 | 0.0720 | 0.0659 | 0.1178 | 0.3905 | -0.0301 | -0.3466 | **-0.4383** | -0.2443 | 0.0301 | 0.0100 | 0.1944 | 1 |

Table 4.3.C. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Internally managed fixed income funds sample.

**Fixed Income Funds (internal)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9372 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9807 | 0.9872 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9629 | 0.9965 | 0.9970 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0105 | -0.0144 | -0.0146 | -0.0143 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0764 | 0.1013 | 0.0929 | 0.0970 | -0.3194 | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.2374 | 0.2033 | 0.2221 | 0.2141 | 0.0108 | -0.0305 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0676 | -0.0393 | -0.0540 | -0.0465 | -0.0072 | -0.1168 | 0.2894 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | 0.0368 | 0.0679 | 0.0544 | 0.0612 | -0.0386 | 0.0731 | **-0.4899** | -0.0540 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1735 | -0.2176 | -0.2009 | -0.2093 | 0.0302 | -0.0719 | -0.1955 | -0.1339 | 0.2325 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1757 | -0.1528 | -0.1669 | -0.1607 | 0.0249 | -0.0229 | -0.2458 | -0.0747 | 0.2435 | -0.0458 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.1240 | -0.0746 | -0.0981 | -0.0875 | -0.0431 | -0.0103 | -0.2271 | -0.0818 | 0.1432 | -0.0562 | -0.0814 | 1 | | | |
| $p15\_20_{i,t}$ | -0.0772 | -0.0295 | -0.0506 | -0.0409 | 0.0442 | 0.0164 | -0.1842 | 0.0538 | 0.1489 | -0.0732 | -0.1060 | -0.1300 | 1 | | |
| $PPP_t$ | 0.1979 | 0.2044 | 0.2056 | 0.2051 | -0.0356 | 0.1557 | 0.1822 | -0.0349 | -0.1515 | -0.2831 | -0.3023 | -0.1516 | 0.0044 | 1 | |
| $STK_t$ | 0.1928 | 0.0851 | 0.1346 | 0.1120 | 0.0358 | -0.1063 | 0.3226 | -0.1579 | -0.2808 | -0.2089 | -0.2660 | -0.2027 | -0.2241 | 0.3149 | 1 |

Table 4.3.D. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Internally managed equity funds sample.

**Equity Funds (internal)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9330 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9785 | 0.9870 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9593 | 0.9966 | 0.9968 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0049 | -0.0300 | -0.0186 | -0.0245 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0408 | 0.0543 | 0.0488 | 0.0516 | **-0.4965** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.1368 | 0.1277 | 0.1334 | 0.1314 | 0.0259 | 0.0199 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0347 | -0.0280 | -0.0321 | -0.0294 | 0.0090 | -0.0052 | 0.2829 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.0412 | -0.0511 | -0.0499 | -0.0496 | 0.0149 | 0.0123 | -0.2322 | -0.0371 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1679 | -0.2137 | -0.1969 | -0.2055 | -0.0343 | -0.0267 | -0.1590 | -0.0893 | 0.0776 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1503 | -0.1367 | -0.1459 | -0.1420 | -0.0371 | -0.0251 | -0.2141 | -0.0839 | 0.0765 | -0.0404 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.1113 | -0.0759 | -0.0927 | -0.0849 | 0.0206 | -0.0408 | -0.2326 | -0.0544 | 0.0139 | -0.0543 | -0.0765 | 1 | | | |
| $p15\_20_{i,t}$ | -0.0508 | -0.0232 | -0.0346 | -0.0294 | 0.0240 | -0.0181 | -0.2302 | -0.0909 | 0.0112 | -0.0683 | -0.0961 | -0.1290 | 1 | | |
| $PPP_t$ | 0.1585 | 0.1892 | 0.1789 | 0.1842 | 0.0277 | 0.0607 | 0.1480 | -0.0206 | -0.0490 | -0.3648 | -0.1739 | -0.0521 | -0.0200 | 1 | |
| $STK_t$ | 0.1963 | 0.1481 | 0.1707 | 0.1609 | 0.1397 | 0.0304 | 0.3950 | 0.0516 | 0.0374 | -0.1874 | -0.2800 | -0.2225 | -0.1789 | 0.2478 | 1 |

Table 4.3.E. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Internally managed emerging equity funds sample. Note: no observations for $PPP_t$=0 (i.e. there are no obs. before 1988) or for $provider\ age_{i,t} = p0\_5_{i,t}$.

**Emerging Equity Funds (internal)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9660 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9870 | 0.9950 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9754 | 0.9991 | 0.9981 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0509 | -0.0915 | -0.0762 | -0.0840 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.3400 | **0.4088** | 0.3874 | 0.3974 | **-0.5016** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | **0.6069** | **0.6203** | **0.6205** | **0.6188** | -0.1384 | **0.4744** | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.3657 | -0.2734 | -0.3110 | -0.2851 | 0.1385 | -0.2597 | **-0.7239** | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | **-0.4500** | **-0.4867** | **-0.4755** | **-0.4784** | 0.3410 | -0.3668 | **-0.7563** | **0.7899** | 1 | | | | | | |
| $p0\_5_{i,t}$ | | | | | | | | | | | | | | | |
| $p5\_10_{i,t}$ | -0.3791 | **-0.4670** | **-0.4352** | **-0.4523** | **0.4735** | -0.2375 | **-0.4776** | **0.4124** | **0.8465** | | 1 | | | | |
| $p10\_15_{i,t}$ | **-0.4078** | -0.2725 | -0.3285 | -0.2941 | -0.0468 | -0.3496 | **-0.4862** | **0.6753** | 0.2316 | | -0.1741 | 1 | | | |
| $p15\_20_{i,t}$ | **0.5622** | **0.5450** | **0.5574** | **0.5492** | -0.0468 | **0.4623** | 0.1117 | -0.1561 | -0.1766 | | -0.1741 | **-0.4545** | 1 | | |
| $PPP_t$ | | | | | | | | | | | | | | | |
| $STK_t$ | **0.6784** | **0.7501** | **0.7286** | **0.7403** | -0.0565 | **0.5016** | **0.6934** | **-0.4689** | **-0.6681** | | **-0.4735** | -0.2740 | 0.3676 | | 1 |

Table 4.3.F. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Internally managed international equity funds sample.

**International Equity Funds (internal)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9406 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9810 | 0.9885 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9636 | 0.9971 | 0.9971 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0010 | -0.0294 | -0.0166 | -0.0235 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0194 | 0.0269 | 0.0235 | 0.0256 | **-0.4991** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.1272 | 0.1133 | 0.1204 | 0.1175 | 0.0146 | 0.0263 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0475 | -0.0301 | -0.0389 | -0.0338 | 0.0151 | 0.0088 | **0.4557** | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.0861 | -0.0591 | -0.0729 | -0.0650 | -0.0047 | 0.0669 | -0.2749 | 0.2024 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1777 | -0.2234 | -0.2064 | -0.2152 | -0.0198 | -0.0148 | -0.1515 | -0.1160 | 0.1376 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1606 | -0.1430 | -0.1536 | -0.1487 | -0.0182 | -0.0319 | -0.2098 | -0.1739 | 0.1416 | -0.0380 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.1278 | -0.0888 | -0.1072 | -0.0983 | 0.0024 | -0.0140 | -0.2440 | -0.1847 | 0.0690 | -0.0532 | -0.0769 | 1 | | | |
| $p15\_20_{i,t}$ | -0.0274 | 0.0038 | -0.0086 | -0.0029 | 0.0013 | -0.0256 | -0.2348 | -0.1891 | -0.0414 | -0.0630 | -0.0910 | -0.1277 | 1 | | |
| $PPP_t$ | 0.1573 | 0.1956 | 0.1814 | 0.1888 | -0.0607 | 0.0746 | 0.1195 | 0.0347 | -0.0382 | -0.2746 | -0.0671 | -0.0783 | -0.0650 | 1 | |
| $STK_t$ | 0.2377 | 0.1672 | 0.1997 | 0.1849 | 0.0996 | 0.0327 | **0.4125** | 0.1578 | -0.0663 | -0.1610 | -0.2445 | -0.2311 | -0.2244 | 0.2018 | 1 |

Table 4.3.G. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Internally managed UK equity funds sample.

**UK Equity Funds (internal)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9281 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9774 | 0.9856 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9570 | 0.9962 | 0.9965 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0090 | -0.0300 | -0.0205 | -0.0250 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0635 | 0.0844 | 0.0762 | 0.0800 | **-0.4929** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.1496 | 0.1441 | 0.1487 | 0.1474 | 0.0442 | 0.0070 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | 0.0058 | 0.0001 | 0.0022 | 0.0020 | -0.0004 | -0.0074 | 0.2440 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.0364 | -0.0441 | -0.0433 | -0.0429 | 0.0308 | -0.0112 | -0.2542 | -0.1330 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1596 | -0.2040 | -0.1878 | -0.1960 | -0.0520 | -0.0409 | -0.1715 | -0.0787 | 0.0513 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1379 | -0.1241 | -0.1334 | -0.1298 | -0.0704 | -0.0125 | -0.2208 | -0.0532 | 0.0406 | -0.0440 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0841 | -0.0519 | -0.0665 | -0.0601 | 0.0483 | -0.0702 | -0.2165 | -0.0592 | 0.0100 | -0.0545 | -0.0737 | 1 | | | |
| $p15\_20_{i,t}$ | -0.0797 | -0.0615 | -0.0695 | -0.0659 | 0.0541 | -0.0191 | -0.2265 | -0.0633 | 0.0352 | -0.0750 | -0.1014 | -0.1256 | 1 | | |
| $PPP_t$ | 0.1632 | 0.1868 | 0.1800 | 0.1836 | 0.1128 | 0.0489 | 0.1829 | -0.0719 | -0.0132 | **-0.4458** | -0.2767 | -0.0338 | 0.0215 | 1 | |
| $STK_t$ | 0.1481 | 0.1202 | 0.1327 | 0.1281 | 0.1971 | 0.0205 | 0.3770 | -0.0253 | 0.1020 | -0.2226 | -0.3247 | -0.2129 | -0.1369 | 0.3063 | 1 |

Table 4.4.A. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Externally managed all funds sample.

**All Funds (external)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9222 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9709 | 0.9878 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9458 | 0.9976 | 0.9959 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0365 | -0.0508 | -0.0463 | -0.0510 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | -0.0024 | -0.0091 | -0.0062 | -0.0067 | **-0.4816** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.0229 | 0.0425 | 0.0340 | 0.0391 | 0.0533 | -0.2564 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | 0.0258 | 0.0433 | 0.0373 | 0.0411 | -0.0475 | 0.0019 | 0.1395 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.1214 | -0.0868 | -0.1028 | -0.0934 | 0.0232 | 0.0588 | -0.2993 | -0.0643 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1657 | -0.1943 | -0.1866 | -0.1905 | 0.0150 | 0.0058 | -0.3102 | -0.0484 | 0.2916 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1427 | -0.1120 | -0.1268 | -0.1191 | -0.0510 | 0.1101 | -0.2550 | 0.0188 | 0.2017 | -0.1467 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0228 | 0.0195 | 0.0035 | 0.0115 | 0.0434 | -0.1193 | 0.0593 | 0.0814 | -0.0422 | -0.1400 | -0.2397 | 1 | | | |
| $p15\_20_{i,t}$ | 0.1134 | 0.0967 | 0.1067 | 0.1015 | 0.0117 | 0.0381 | -0.1636 | 0.0066 | -0.0688 | -0.1241 | -0.2125 | -0.2027 | 1 | | |
| $PPP_t$ | 0.0414 | 0.0509 | 0.0481 | 0.0497 | 0.0033 | 0.0351 | 0.0762 | -0.0853 | -0.0075 | -0.2185 | 0.0230 | 0.0330 | 0.0293 | 1 | |
| $STK_t$ | -0.1227 | -0.1590 | -0.1493 | -0.1537 | 0.0751 | -0.0125 | 0.3324 | -0.2456 | -0.0059 | -0.1063 | -0.0670 | -0.1775 | 0.0034 | 0.2043 | 1 |

Table 4.4.B. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Externally managed allocation funds sample.

**Allocation Funds (external)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9269 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9721 | 0.9890 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9488 | 0.9978 | 0.9963 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0157 | -0.0237 | -0.0213 | -0.0239 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | 0.0192 | -0.0017 | 0.0074 | 0.0025 | **-0.5561** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.0913 | 0.0857 | 0.0891 | 0.0871 | 0.0463 | -0.2043 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | 0.0486 | 0.0832 | 0.0711 | 0.0785 | -0.0254 | 0.0854 | -0.1023 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.0853 | -0.0369 | -0.0576 | -0.0450 | 0.0543 | 0.0329 | **-0.4136** | 0.2049 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1828 | -0.1970 | -0.1954 | -0.1958 | 0.0460 | -0.0774 | -0.3526 | -0.1202 | 0.3557 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1685 | -0.1755 | -0.1751 | -0.1761 | -0.1986 | 0.2848 | -0.3261 | 0.0828 | 0.2083 | -0.1601 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.1486 | -0.1122 | -0.1296 | -0.1191 | 0.0666 | -0.2704 | 0.1314 | 0.0311 | -0.0233 | -0.1859 | -0.2795 | 1 | | | |
| $p15\_20_{i,t}$ | 0.2340 | 0.2483 | 0.2485 | 0.2481 | 0.1012 | 0.0336 | -0.1945 | 0.1645 | -0.0091 | -0.1185 | -0.1782 | -0.2070 | 1 | | |
| $PPP_t$ | 0.0457 | 0.0682 | 0.0603 | 0.0656 | 0.0011 | -0.0033 | 0.0601 | -0.0989 | -0.0012 | -0.1683 | 0.0269 | 0.0313 | 0.0199 | 1 | |
| $STK_t$ | -0.0511 | -0.0773 | -0.0690 | -0.0732 | 0.1181 | 0.0401 | 0.3621 | **-0.4816** | -0.0129 | -0.0965 | -0.0400 | -0.1483 | -0.0504 | 0.1435 | 1 |

Table 4.4.C. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Externally managed fixed income funds sample.

**Fixed Income Funds (external)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9022 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9632 | 0.9848 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9322 | 0.9969 | 0.9950 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0325 | -0.0204 | -0.0267 | -0.0244 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | -0.0107 | -0.0090 | -0.0089 | -0.0079 | -0.3756 | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.0325 | 0.0847 | 0.0645 | 0.0755 | 0.1599 | -0.2863 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | -0.0173 | 0.0061 | -0.0033 | 0.0018 | -0.0534 | 0.0475 | 0.2365 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.0766 | -0.0553 | -0.0658 | -0.0594 | 0.0382 | 0.0149 | -0.2936 | 0.0534 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1395 | -0.1849 | -0.1708 | -0.1787 | 0.0049 | -0.0207 | -0.3238 | -0.0076 | 0.1508 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1238 | -0.1062 | -0.1160 | -0.1107 | -0.0885 | 0.0531 | -0.1188 | 0.2331 | -0.0169 | -0.1283 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0569 | 0.0094 | -0.0177 | -0.0033 | 0.1058 | -0.1296 | 0.2248 | 0.2565 | 0.1102 | -0.1408 | -0.2466 | 1 | | | |
| $p15\_20_{i,t}$ | 0.0845 | 0.1064 | 0.1022 | 0.1044 | -0.1193 | 0.2094 | -0.2287 | -0.0906 | 0.0496 | -0.0836 | -0.1464 | -0.1607 | 1 | | |
| $PPP_t$ | 0.0275 | 0.0290 | 0.0292 | 0.0287 | 0.0310 | 0.0471 | 0.0737 | -0.0590 | 0.0136 | -0.1067 | -0.0510 | 0.0324 | 0.0193 | 1 | |
| $STK_t$ | -0.0906 | -0.1395 | -0.1247 | -0.1323 | 0.0923 | -0.1059 | 0.2925 | -0.1909 | -0.1525 | -0.0682 | -0.0214 | -0.1351 | -0.0989 | 0.2358 | 1 |

Table 4.4.D. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Externally managed equity funds sample.

**Equity Funds (external)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9249 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9721 | 0.9882 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9477 | 0.9977 | 0.9960 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0346 | -0.0556 | -0.0484 | -0.0548 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | -0.0196 | -0.0266 | -0.0241 | -0.0243 | **-0.4991** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.0318 | 0.0498 | 0.0420 | 0.0467 | 0.0432 | -0.2509 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | 0.0701 | 0.0978 | 0.0889 | 0.0946 | -0.0396 | 0.0124 | 0.1436 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.1398 | -0.1107 | -0.1249 | -0.1164 | 0.0075 | 0.0571 | -0.2867 | -0.0139 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1701 | -0.1980 | -0.1906 | -0.1941 | 0.0099 | 0.0195 | -0.3036 | -0.0489 | 0.2905 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1449 | -0.1089 | -0.1257 | -0.1170 | -0.0373 | 0.1036 | -0.2670 | -0.0399 | 0.2255 | -0.1508 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0006 | 0.0388 | 0.0246 | 0.0315 | 0.0304 | -0.1008 | 0.0373 | 0.0203 | -0.0582 | -0.1378 | -0.2415 | 1 | | | |
| $p15\_20_{i,t}$ | 0.1198 | 0.0925 | 0.1065 | 0.0993 | 0.0199 | 0.0082 | -0.1579 | 0.0784 | -0.0961 | -0.1294 | -0.2268 | -0.2072 | 1 | | |
| $PPP_t$ | 0.0449 | 0.0557 | 0.0524 | 0.0542 | 0.0001 | 0.0366 | 0.0786 | -0.1260 | -0.0104 | -0.2447 | 0.0369 | 0.0337 | 0.0317 | 1 | |
| $STK_t$ | -0.1330 | -0.1656 | -0.1575 | -0.1610 | 0.0736 | -0.0008 | 0.3383 | -0.3633 | 0.0142 | -0.1172 | -0.0751 | -0.1846 | 0.0251 | 0.2069 | 1 |

Table 4.4.E. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Externally managed emerging equity funds sample. Note: no observations for PPP=0 (= no obs. before 1988).

**Emerging Equity Funds (external)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9237 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9697 | 0.9892 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9434 | 0.9981 | 0.9956 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0567 | -0.1031 | -0.0885 | -0.1037 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | -0.0022 | 0.0006 | -0.0001 | 0.0038 | **-0.5529** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | -0.0216 | -0.0536 | -0.0431 | -0.0475 | 0.0468 | -0.2969 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | 0.0671 | 0.0915 | 0.0831 | 0.0903 | -0.0605 | -0.0098 | 0.0995 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.1538 | -0.1029 | -0.1255 | -0.1110 | -0.0386 | 0.0769 | -0.3500 | 0.1527 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1581 | -0.1627 | -0.1645 | -0.1625 | -0.0951 | 0.2676 | -0.3531 | -0.0484 | **0.5639** | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.0694 | -0.0219 | -0.0409 | -0.0313 | 0.0208 | -0.0124 | -0.2620 | -0.0233 | 0.1943 | -0.1459 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0037 | -0.0083 | -0.0061 | -0.0083 | 0.0612 | -0.1577 | 0.1316 | 0.0683 | -0.1207 | -0.1451 | -0.1861 | 1 | | | |
| $p15\_20_{i,t}$ | -0.0197 | -0.0659 | -0.0482 | -0.0575 | 0.0224 | -0.1492 | 0.0417 | -0.1061 | -0.2243 | -0.1818 | -0.2333 | -0.2319 | 1 | | |
| $PPP_t$ | | | | | | | | | | | | | | | |
| $STK_t$ | -0.1663 | -0.19 | -0.1856 | -0.1875 | 0.0175 | 0.1754 | 0.2467 | -0.3709 | 0.1021 | 0.0852 | -0.012 | -0.2046 | -0.0755 | | 1 |

Table 4.4.F. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Externally managed international equity funds sample.

**International Equity Funds (external)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9297 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9746 | 0.9885 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9519 | 0.9977 | 0.9962 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0384 | -0.0631 | -0.0541 | -0.0611 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | -0.0176 | -0.0167 | -0.0174 | -0.0158 | **-0.4884** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.0002 | 0.0141 | 0.0069 | 0.0114 | 0.0316 | -0.2503 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | 0.0562 | 0.0960 | 0.0819 | 0.0904 | -0.0476 | 0.0182 | 0.1077 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.1111 | -0.0755 | -0.0917 | -0.0821 | -0.0009 | 0.0794 | -0.2819 | 0.0595 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1828 | -0.2119 | -0.2038 | -0.2077 | 0.0098 | 0.0432 | -0.3090 | -0.0672 | 0.2947 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1619 | -0.1287 | -0.1449 | -0.1367 | -0.0475 | 0.1159 | -0.2712 | -0.0360 | 0.1984 | -0.1433 | 1 | | | | |
| $p10\_15_{i,t}$ | -0.0156 | 0.0292 | 0.0123 | 0.0205 | 0.0467 | -0.1272 | 0.0484 | 0.0368 | -0.0455 | -0.1394 | -0.2286 | 1 | | | |
| $p15\_20_{i,t}$ | 0.1277 | 0.1005 | 0.1149 | 0.1076 | 0.0299 | 0.0276 | -0.1504 | 0.1501 | -0.0659 | -0.1364 | -0.2238 | -0.2176 | 1 | | |
| $PPP_t$ | 0.0541 | 0.0667 | 0.0627 | 0.0649 | -0.0218 | 0.0342 | 0.0897 | -0.1231 | -0.0402 | -0.2740 | 0.0393 | 0.0382 | 0.0374 | 1 | |
| $STK_t$ | -0.1241 | -0.1759 | -0.1598 | -0.1675 | 0.0524 | -0.0034 | 0.3778 | -0.3603 | -0.0452 | -0.1050 | -0.1212 | -0.2063 | 0.0410 | 0.2105 | 1 |

Table 4.4.G. Correlation coefficient between independent variables. In bold are correlations with absolute value larger than 0.4 for variables that are used in the same specification. Externally managed UK equity funds sample.

**UK Equity Funds (external)**

| | $age_{i,t}$ | $\ln(age_{i,t}+1)$ | $\sqrt[2]{age_{i,t}}$ | $\sqrt[3]{age_{i,t}}$ | $Bear_{i,t}$ | $Bull_{i,t}$ | $size_{i,t-1}$ | $Share_{i,t-1}$ | $ABIshare_{i,t-1}$ | $p0\_5_{i,t}$ | $p5\_10_{i,t}$ | $p10\_15_{i,t}$ | $p15\_20_{i,t}$ | $PPP_t$ | $STK_t$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $age_{i,t}$ | 1 | | | | | | | | | | | | | | |
| $\ln(age_{i,t}+1)$ | 0.9181 | 1 | | | | | | | | | | | | | |
| $\sqrt[2]{age_{i,t}}$ | 0.9681 | 0.9880 | 1 | | | | | | | | | | | | |
| $\sqrt[3]{age_{i,t}}$ | 0.9416 | 0.9977 | 0.9958 | 1 | | | | | | | | | | | |
| $Bear_{i,t}$ | -0.0207 | -0.0348 | -0.0304 | -0.0353 | 1 | | | | | | | | | | |
| $Bull_{i,t}$ | -0.0262 | -0.0453 | -0.0385 | -0.0412 | **-0.5074** | 1 | | | | | | | | | |
| $Size_{i,t-1}$ | 0.0797 | 0.1058 | 0.0966 | 0.1020 | 0.0616 | -0.2484 | 1 | | | | | | | | |
| $Share_{i,t-1}$ | 0.0663 | 0.0815 | 0.0775 | 0.0804 | -0.0201 | 0.0027 | 0.2021 | 1 | | | | | | | |
| $ABIshare_{i,t-1}$ | -0.1484 | -0.1338 | -0.1425 | -0.1373 | 0.0123 | 0.0380 | -0.2940 | -0.0505 | 1 | | | | | | |
| $p0\_5_{i,t}$ | -0.1567 | -0.1846 | -0.1775 | -0.1810 | 0.0237 | -0.0457 | -0.2926 | -0.0270 | 0.2876 | 1 | | | | | |
| $p5\_10_{i,t}$ | -0.1206 | -0.0848 | -0.1007 | -0.0924 | -0.0333 | 0.1020 | -0.2625 | -0.0259 | 0.2388 | -0.1602 | 1 | | | | |
| $p10\_15_{i,t}$ | 0.0240 | 0.0580 | 0.0469 | 0.0523 | 0.0061 | -0.0592 | 0.0125 | -0.0084 | -0.0735 | -0.1344 | -0.2649 | 1 | | | |
| $p15\_20_{i,t}$ | 0.1190 | 0.0981 | 0.1092 | 0.1034 | 0.0073 | -0.0009 | -0.1960 | -0.0377 | -0.0992 | -0.1146 | -0.2257 | -0.1895 | 1 | | |
| $PPP_t$ | 0.0360 | 0.0451 | 0.0424 | 0.0441 | 0.0359 | 0.0436 | 0.0672 | -0.1400 | 0.0254 | -0.2178 | 0.0349 | 0.0293 | 0.0250 | 1 | |
| $STK_t$ | -0.1261 | -0.1279 | -0.1315 | -0.1286 | 0.1098 | -0.0136 | 0.2964 | -0.3602 | 0.0580 | -0.1626 | -0.0230 | -0.1506 | 0.0155 | 0.2050 | 1 |

## M. Summary statistics for the independent variables (Chapter 4)

This Appendix shows the summary statistics for all individual explanatory variables used in specification (4). The statistics are sorted by fund type and management type. The columns under 'Internal' show the statistics for all observations in each internally managed sample. The columns under 'External' show the statistics for all observations in each externally managed sample.

| | | ***Internal*** | | | | ***External*** | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Sample** | **Variable** | **Mean** | **Std. Dev.** | **Min** | **Max** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| All Funds | $age_{i,t}$ | 10.23 | 7.71 | 0.50 | 34.92 | 4.95 | 4.95 | 0.51 | 31.00 |
| | $\ln(age_{i,t}+1)$ | 2.15 | 0.78 | 0.41 | 3.58 | 1.53 | 0.68 | 0.41 | 3.47 |
| | $\sqrt[2]{age_{i,t}}$ | 2.95 | 1.23 | 0.71 | 5.91 | 2.01 | 0.95 | 0.71 | 5.57 |
| | $\sqrt[3]{age_{i,t}}$ | 2.01 | 0.58 | 0.80 | 3.27 | 1.56 | 0.48 | 0.80 | 3.14 |
| | $Bear_{i,t}$ | 0.19 | 0.39 | 0.00 | 1.00 | 0.23 | 0.42 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.46 | 0.50 | 0.00 | 1.00 | 0.43 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 1.51 | 1.40 | 0.01 | 6.44 | 1.45 | 1.17 | 0.01 | 4.33 |
| | $Share_{i,t-1}$ | 7.77 | 9.62 | 0.26 | 100.00 | 10.41 | 12.10 | 0.11 | 100.00 |
| | $ABIshare_{i,t-1}$ | 8.79 | 6.79 | 0.31 | 100.00 | 15.64 | 13.44 | 0.27 | 100.00 |
| | $p0\_5_{i,t}$ | 0.03 | 0.16 | 0.00 | 1.00 | 0.03 | 0.16 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.05 | 0.22 | 0.00 | 1.00 | 0.03 | 0.16 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.09 | 0.29 | 0.00 | 1.00 | 0.05 | 0.21 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.14 | 0.34 | 0.00 | 1.00 | 0.06 | 0.24 | 0.00 | 1.00 |
| | $PPP_t$ | 0.96 | 0.19 | 0.00 | 1.00 | 1.00 | 0.07 | 0.00 | 1.00 |
| | $STK_t$ | 0.66 | 0.47 | 0.00 | 1.00 | 0.90 | 0.30 | 0.00 | 1.00 |
| Allocation Funds | $age_{i,t}$ | 7.58 | 5.20 | 0.51 | 22.93 | 5.10 | 4.84 | 0.51 | 30.54 |
| | $\ln(age_{i,t}+1)$ | 1.95 | 0.67 | 0.41 | 3.18 | 1.56 | 0.69 | 0.41 | 3.45 |
| | $\sqrt[2]{age_{i,t}}$ | 2.58 | 0.97 | 0.71 | 4.79 | 2.05 | 0.95 | 0.71 | 5.53 |
| | $\sqrt[3]{age_{i,t}}$ | 1.85 | 0.48 | 0.80 | 2.84 | 1.58 | 0.48 | 0.80 | 3.13 |
| | $Bear_{i,t}$ | 0.16 | 0.36 | 0.00 | 1.00 | 0.26 | 0.44 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.55 | 0.50 | 0.00 | 1.00 | 0.47 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 1.34 | 0.54 | 0.01 | 2.01 | 1.29 | 1.02 | 0.01 | 4.33 |
| | $Share_{i,t-1}$ | 5.76 | 3.29 | 0.61 | 23.53 | 9.98 | 8.46 | 0.31 | 41.67 |
| | $ABIshare_{i,t-1}$ | 10.94 | 11.10 | 1.61 | 50.00 | 16.51 | 14.84 | 0.87 | 100.00 |
| | $p0\_5_{i,t}$ | 0.02 | 0.14 | 0.00 | 1.00 | 0.02 | 0.14 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.02 | 0.14 | 0.00 | 1.00 | 0.04 | 0.19 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.06 | 0.25 | 0.00 | 1.00 | 0.06 | 0.24 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.05 | 0.21 | 0.00 | 1.00 | 0.07 | 0.26 | 0.00 | 1.00 |
| | $PPP_t$ | 1.00 | 0.06 | 0.00 | 1.00 | 1.00 | 0.05 | 0.00 | 1.00 |
| | $STK_t$ | 0.90 | 0.30 | 0.00 | 1.00 | 0.87 | 0.33 | 0.00 | 1.00 |
| Fixed Income Funds | $age_{i,t}$ | 11.39 | 8.58 | 0.51 | 34.92 | 4.40 | 4.87 | 0.51 | 29.79 |
| | $\ln(age_{i,t}+1)$ | 2.23 | 0.81 | 0.41 | 3.58 | 1.44 | 0.66 | 0.41 | 3.43 |
| | $\sqrt[2]{age_{i,t}}$ | 3.10 | 1.32 | 0.71 | 5.91 | 1.89 | 0.91 | 0.71 | 5.46 |
| | $\sqrt[3]{age_{i,t}}$ | 2.08 | 0.62 | 0.80 | 3.27 | 1.49 | 0.46 | 0.80 | 3.10 |
| | $Bear_{i,t}$ | 0.11 | 0.32 | 0.00 | 1.00 | 0.20 | 0.40 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.44 | 0.50 | 0.00 | 1.00 | 0.36 | 0.48 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 1.42 | 1.16 | 0.01 | 6.44 | 1.62 | 1.15 | 0.01 | 4.33 |
| | $Share_{i,t-1}$ | 10.53 | 10.21 | 0.64 | 85.71 | 22.89 | 25.13 | 0.39 | 100.00 |
| | $ABIshare_{i,t-1}$ | 6.66 | 3.95 | 0.31 | 20.00 | 9.07 | 9.24 | 0.27 | 100.00 |
| | $p0\_5_{i,t}$ | 0.03 | 0.17 | 0.00 | 1.00 | 0.02 | 0.14 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.06 | 0.24 | 0.00 | 1.00 | 0.02 | 0.13 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.09 | 0.29 | 0.00 | 1.00 | 0.04 | 0.19 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.14 | 0.35 | 0.00 | 1.00 | 0.05 | 0.22 | 0.00 | 1.00 |
| | $PPP_t$ | 0.94 | 0.23 | 0.00 | 1.00 | 1.00 | 0.06 | 0.00 | 1.00 |
| | $STK_t$ | 0.62 | 0.48 | 0.00 | 1.00 | 0.93 | 0.25 | 0.00 | 1.00 |

| Sample | Variable | Internal Mean | Internal Std. Dev. | Internal Min | Internal Max | External Mean | External Std. Dev. | External Min | External Max |
|---|---|---|---|---|---|---|---|---|---|
| Equity Funds | $age_{i,t}$ | 9.80 | 7.34 | 0.50 | 34.92 | 5.01 | 4.89 | 0.51 | 30.54 |
| | $\ln(age_{i,t}+1)$ | 2.12 | 0.76 | 0.41 | 3.58 | 1.54 | 0.68 | 0.41 | 3.45 |
| | $\sqrt[2]{age_{i,t}}$ | 2.89 | 1.19 | 0.71 | 5.91 | 2.03 | 0.94 | 0.71 | 5.53 |
| | $\sqrt[3]{age_{i,t}}$ | 1.99 | 0.57 | 0.80 | 3.27 | 1.57 | 0.48 | 0.80 | 3.13 |
| | $Bear_{i,t}$ | 0.22 | 0.42 | 0.00 | 1.00 | 0.24 | 0.43 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.46 | 0.50 | 0.00 | 1.00 | 0.44 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 1.49 | 1.42 | 0.01 | 6.44 | 1.43 | 1.17 | 0.01 | 4.33 |
| | $Share_{i,t-1}$ | 5.91 | 5.87 | 0.26 | 100.00 | 8.39 | 7.04 | 0.11 | 75.00 |
| | $ABIshare_{i,t-1}$ | 9.36 | 5.92 | 0.31 | 35.29 | 16.70 | 13.62 | 0.32 | 100.00 |
| | $p0\_5_{i,t}$ | 0.03 | 0.16 | 0.00 | 1.00 | 0.03 | 0.16 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.05 | 0.23 | 0.00 | 1.00 | 0.03 | 0.16 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.09 | 0.29 | 0.00 | 1.00 | 0.05 | 0.21 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.14 | 0.35 | 0.00 | 1.00 | 0.07 | 0.25 | 0.00 | 1.00 |
| | $PPP_t$ | 0.97 | 0.17 | 0.00 | 1.00 | 0.99 | 0.07 | 0.00 | 1.00 |
| | $STK_t$ | 0.66 | 0.47 | 0.00 | 1.00 | 0.89 | 0.31 | 0.00 | 1.00 |
| Emerging Equity Funds | $age_{i,t}$ | 6.36 | 3.51 | 0.50 | 12.26 | 4.25 | 4.37 | 0.51 | 25.96 |
| | $\ln(age_{i,t}+1)$ | 1.85 | 0.58 | 0.41 | 2.58 | 1.41 | 0.67 | 0.41 | 3.29 |
| | $\sqrt[2]{age_{i,t}}$ | 2.40 | 0.77 | 0.71 | 3.50 | 1.86 | 0.89 | 0.71 | 5.09 |
| | $\sqrt[3]{age_{i,t}}$ | 1.77 | 0.40 | 0.80 | 2.31 | 1.48 | 0.47 | 0.80 | 2.96 |
| | $Bear_{i,t}$ | 0.23 | 0.42 | 0.00 | 1.00 | 0.26 | 0.44 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.46 | 0.50 | 0.00 | 1.00 | 0.47 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 1.04 | 0.45 | 0.21 | 1.99 | 1.23 | 0.96 | 0.03 | 4.33 |
| | $Share_{i,t-1}$ | 33.58 | 14.73 | 5.56 | 57.14 | 9.97 | 6.81 | 0.38 | 50.00 |
| | $ABIshare_{i,t-1}$ | 4.88 | 4.39 | 0.79 | 19.05 | 13.15 | 10.96 | 0.82 | 66.67 |
| | $p0\_5_{i,t}$ | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.09 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.06 | 0.24 | 0.00 | 1.00 | 0.02 | 0.15 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.31 | 0.47 | 0.00 | 1.00 | 0.04 | 0.20 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.31 | 0.47 | 0.00 | 1.00 | 0.03 | 0.18 | 0.00 | 1.00 |
| | $PPP_t$ | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 |
| | $STK_t$ | 0.77 | 0.42 | 0.00 | 1.00 | 0.94 | 0.24 | 0.00 | 1.00 |
| International Equity Funds | $age_{i,t}$ | 9.80 | 6.88 | 0.51 | 30.54 | 5.47 | 5.32 | 0.51 | 26.93 |
| | $\ln(age_{i,t}+1)$ | 2.14 | 0.75 | 0.41 | 3.45 | 1.60 | 0.71 | 0.41 | 3.33 |
| | $\sqrt[2]{age_{i,t}}$ | 2.91 | 1.15 | 0.71 | 5.53 | 2.11 | 1.01 | 0.71 | 5.19 |
| | $\sqrt[3]{age_{i,t}}$ | 2.00 | 0.55 | 0.80 | 3.13 | 1.61 | 0.51 | 0.80 | 3.00 |
| | $Bear_{i,t}$ | 0.22 | 0.42 | 0.00 | 1.00 | 0.23 | 0.42 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.46 | 0.50 | 0.00 | 1.00 | 0.44 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 1.56 | 1.50 | 0.00 | 6.44 | 1.48 | 1.20 | 0.01 | 4.33 |
| | $Share_{i,t-1}$ | 5.77 | 4.13 | 0.26 | 25.00 | 9.17 | 7.40 | 0.13 | 75.00 |
| | $ABIshare_{i,t-1}$ | 6.53 | 3.58 | 0.31 | 18.18 | 14.29 | 12.51 | 0.32 | 100.00 |
| | $p0\_5_{i,t}$ | 0.03 | 0.16 | 0.00 | 1.00 | 0.02 | 0.14 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.05 | 0.22 | 0.00 | 1.00 | 0.03 | 0.17 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.10 | 0.30 | 0.00 | 1.00 | 0.05 | 0.22 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.13 | 0.34 | 0.00 | 1.00 | 0.07 | 0.26 | 0.00 | 1.00 |
| | $PPP_t$ | 0.98 | 0.15 | 0.00 | 1.00 | 0.99 | 0.08 | 0.00 | 1.00 |
| | $STK_t$ | 0.65 | 0.48 | 0.00 | 1.00 | 0.87 | 0.34 | 0.00 | 1.00 |

| Sample | Variable | Internal Mean | Internal Std. Dev. | Internal Min | Internal Max | External Mean | External Std. Dev. | External Min | External Max |
|---|---|---|---|---|---|---|---|---|---|
| UK Equity Funds | $age_{i,t}$ | 9.86 | 7.96 | 0.51 | 34.92 | 4.49 | 4.24 | 0.52 | 30.54 |
| | $\ln(age_{i,t}+1)$ | 2.10 | 0.78 | 0.41 | 3.58 | 1.49 | 0.63 | 0.42 | 3.45 |
| | $\sqrt[2]{age_{i,t}}$ | 2.88 | 1.25 | 0.71 | 5.91 | 1.94 | 0.85 | 0.72 | 5.53 |
| | $\sqrt[3]{age_{i,t}}$ | 1.98 | 0.59 | 0.80 | 3.27 | 1.53 | 0.44 | 0.80 | 3.13 |
| | $Bear_{i,t}$ | 0.22 | 0.42 | 0.00 | 1.00 | 0.25 | 0.43 | 0.00 | 1.00 |
| | $Bull_{i,t}$ | 0.46 | 0.50 | 0.00 | 1.00 | 0.44 | 0.50 | 0.00 | 1.00 |
| | $Size_{i,t-1}$ | 1.46 | 1.31 | 0.01 | 6.44 | 1.38 | 1.14 | 0.01 | 4.33 |
| | $Share_{i,t-1}$ | 5.68 | 6.42 | 0.28 | 100.00 | 7.18 | 6.35 | 0.11 | 50.00 |
| | $ABIshare_{i,t-1}$ | 13.09 | 6.23 | 0.50 | 35.29 | 20.31 | 14.45 | 0.54 | 100.00 |
| | $p0\_5_{i,t}$ | 0.03 | 0.17 | 0.00 | 1.00 | 0.04 | 0.19 | 0.00 | 1.00 |
| | $p5\_10_{i,t}$ | 0.06 | 0.23 | 0.00 | 1.00 | 0.03 | 0.16 | 0.00 | 1.00 |
| | $p10\_15_{i,t}$ | 0.08 | 0.28 | 0.00 | 1.00 | 0.04 | 0.20 | 0.00 | 1.00 |
| | $p15\_20_{i,t}$ | 0.15 | 0.35 | 0.00 | 1.00 | 0.06 | 0.24 | 0.00 | 1.00 |
| | $PPP_t$ | 0.96 | 0.20 | 0.00 | 1.00 | 1.00 | 0.06 | 0.00 | 1.00 |
| | $STK_t$ | 0.68 | 0.47 | 0.00 | 1.00 | 0.92 | 0.28 | 0.00 | 1.00 |

## N. Results with the linear, logarithmic, and cubic root age functions (Chapter 4)

Table N1.A. Results for the internally managed all-funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.1111** | **0.1786** | **0.1674** | **0.0801** | **0.2657** | **0.1244** | **0.0462** | **0.2919** | **0.0910** |
| | (0.257) | (0.589) | (0.495) | (0.503) | (0.496) | (0.702) | (0.767) | (0.497) | (0.813) |
| $f(age_{i,t})$ | **0.0063** | **-0.0066** | **0.0049** | **0.0456** | **-0.0515** | **0.0530** | **0.0702** | **-0.0714** | **0.0721** |
| | (0.618) | (0.636) | (0.752) | (0.570) | (0.650) | (0.680) | (0.567) | (0.657) | (0.692) |
| $Bear_{i,t}$ | **-0.4161***** | **0.0583** | **0.0249** | **-0.3826***** | **-0.0302** | **-0.0260** | **-0.3764***** | **-0.0593** | **-0.0459** |
| | (0.000) | (0.473) | (0.739) | (0.000) | (0.822) | (0.817) | (0.000) | (0.700) | (0.725) |
| $Bull_{i,t}$ | **0.2464***** | **0.1753** | **0.0505** | **0.3650***** | **0.2930*** | **0.1592** | **0.4214***** | **0.3318*** | **0.1941** |
| | (0.000) | (0.110) | (0.592) | (0.000) | (0.089) | (0.279) | (0.000) | (0.096) | (0.248) |
| $Size_{i,t-1}$ | **-0.1012***** | **-0.0154** | **0.0199** | **-0.1750***** | **-0.0938** | **-0.0124** | **-0.2089***** | **-0.1029** | **-0.0109** |
| | (0.001) | (0.755) | (0.702) | (0.007) | (0.238) | (0.850) | (0.010) | (0.258) | (0.888) |
| $Share_{i,t-1}$ | **0.0000** | **-0.0005** | **-0.0011** | **-0.0000** | **0.0000** | **-0.0010** | **0.0001** | **-0.0000** | **-0.0010** |
| | (0.994) | (0.862) | (0.750) | (0.992) | (0.989) | (0.775) | (0.934) | (0.992) | (0.777) |
| $ABIshare_{i,t-1}$ | **0.0047** | **0.0134**** | **0.0101*** | **0.0037** | **0.0128**** | **0.0091*** | **0.0038** | **0.0130**** | **0.0093*** |
| | (0.272) | (0.029) | (0.057) | (0.405) | (0.044) | (0.074) | (0.397) | (0.040) | (0.069) |
| $p0\_5_{i,t}$ | **-0.0077** | **-0.0257** | **0.1737** | **-0.0419** | **-0.1797** | **0.2228** | **-0.0529** | **-0.3362** | **0.2668** |
| | (0.960) | (0.942) | (0.566) | (0.837) | (0.718) | (0.601) | (0.857) | (0.655) | (0.673) |
| $p5\_10_{i,t}$ | **-0.0369** | **-0.1615** | **-0.1629** | **-0.0520** | **-0.1779** | **-0.1550** | **-0.0671** | **-0.2000** | **-0.1894** |
| | (0.772) | (0.545) | (0.456) | (0.764) | (0.652) | (0.630) | (0.775) | (0.695) | (0.654) |
| $p10\_15_{i,t}$ | **-0.0437** | **-0.1091** | **0.0639** | **-0.0838** | **-0.2443** | **0.0970** | **-0.1159** | **-0.3168** | **0.1116** |
| | (0.619) | (0.442) | (0.663) | (0.551) | (0.270) | (0.676) | (0.526) | (0.254) | (0.694) |
| $p15\_20_{i,t}$ | **-0.0323** | **-0.0877** | **-0.0418** | **-0.0630** | **-0.2144** | **-0.0508** | **-0.0813** | **-0.2681** | **-0.0734** |
| | (0.566) | (0.367) | (0.635) | (0.494) | (0.214) | (0.753) | (0.480) | (0.191) | (0.698) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.0100** | **0.0317** | **-0.0043** | **0.0296** | **0.1986** | **-0.0468** | **0.0426** | **0.2973** | **-0.0731** |
| | (0.750) | (0.740) | (0.955) | (0.802) | (0.535) | (0.859) | (0.812) | (0.542) | (0.855) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0083** | **0.0029** | **0.0129** | **0.0240** | **0.0344** | **0.0346** | **0.0379** | **0.0456** | **0.0578** |
| | (0.422) | (0.919) | (0.563) | (0.778) | (0.842) | (0.809) | (0.756) | (0.854) | (0.779) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0096*** | **0.0104** | **-0.0027** | **0.0511** | **0.1216** | **-0.0262** | **0.0744** | **0.1651** | **-0.0346** |
| | (0.057) | (0.316) | (0.769) | (0.420) | (0.160) | (0.758) | (0.390) | (0.170) | (0.765) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **0.0051*** | **0.0080** | **0.0041** | **0.0337** | **0.1007** | **0.0232** | **0.0471** | **0.1336** | **0.0366** |
| | (0.098) | (0.165) | (0.387) | (0.416) | (0.114) | (0.697) | (0.387) | (0.111) | (0.634) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0039**** | **0.0021** | **-0.0001** | **0.0492**** | **0.0384** | **0.0092** | **0.0676**** | **0.0468** | **0.0099** |
| | (0.017) | (0.320) | (0.970) | (0.042) | (0.128) | (0.655) | (0.039) | (0.150) | (0.717) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **-0.0011** | **0.0053** | **0.0037** | **-0.0197** | **0.0682** | **0.0424** | **-0.0240** | **0.0867** | **0.0549** |
| | (0.768) | (0.207) | (0.356) | (0.457) | (0.275) | (0.492) | (0.521) | (0.255) | (0.463) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0100***** | **-0.0072** | **-0.0065** | **-0.1025***** | **-0.0871** | **-0.0805** | **-0.1372***** | **-0.1126** | **-0.1034** |
| | (0.001) | (0.161) | (0.116) | (0.003) | (0.181) | (0.139) | (0.002) | (0.173) | (0.131) |
| $PPP_t$ | **-0.1025** | **-0.1460** | **-0.1729** | **-0.0911** | **-0.1633** | **-0.1733** | **-0.0956** | **-0.1613** | **-0.1741** |
| | (0.273) | (0.615) | (0.382) | (0.224) | (0.574) | (0.372) | (0.225) | (0.580) | (0.373) |
| $STK_t$ | **-0.0198** | **0.0045** | **-0.0159** | **-0.0065** | **-0.0091** | **-0.0141** | **-0.0117** | **-0.0066** | **-0.0159** |
| | (0.853) | (0.959) | (0.864) | (0.932) | (0.896) | (0.852) | (0.889) | (0.929) | (0.844) |
| $R^2$ within | 0.3167 | 0.0119 | 0.0087 | 0.3160 | 0.0140 | 0.0097 | 0.3170 | 0.0136 | 0.0095 |
| F-statistic | 69.8306 | 5.9332 | 21.2482 | 61.6661 | 6.5541 | 15.5310 | 62.3615 | 7.3728 | 16.0344 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 | 933 |
| Observations | 9756 | 9756 | 9756 | 9756 | 9756 | 9756 | 9756 | 9756 | 9756 |

Table N1.B. Results for the internally managed allocation funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.1641** | **-0.3193** | **0.2573** | **0.0352** | **-0.9947** | **0.1123** | **-0.0604** | **-1.9380** | **-0.9292** |
| | (0.781) | (0.809) | (0.860) | (0.958) | (0.610) | (0.954) | (0.933) | (0.348) | (0.702) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0028** | **0.1397** | **0.1549** | **0.1306** | **1.2388** | **1.2137** | **0.1490** | **1.7666** | **1.7265** |
| | (0.937) | (0.226) | (0.195) | (0.501) | (0.141) | (0.163) | (0.604) | (0.145) | (0.171) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.3829**** | **0.8504**** | **1.1812*** | **-0.0873** | **0.7561** | **1.7331** | **0.0064** | **0.8186** | **1.9763** |
| | (0.035) | (0.039) | (0.057) | (0.814) | (0.430) | (0.176) | (0.989) | (0.480) | (0.203) |
| $\boldsymbol{Bull_{i,t}}$ | **0.2855** | **1.0969*** | **1.4159*** | **0.6541**** | **1.6814** | **2.5125*** | **0.7994**** | **1.9134** | **2.9372*** |
| | (0.101) | (0.064) | (0.093) | (0.030) | (0.108) | (0.077) | (0.026) | (0.134) | (0.090) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.2334** | **1.3244** | **2.0817** | **0.1898** | **0.8260** | **0.6889** | **0.3384** | **1.6003** | **1.4959** |
| | (0.612) | (0.383) | (0.282) | (0.729) | (0.516) | (0.670) | (0.639) | (0.172) | (0.466) |
| $\boldsymbol{Share_{i,t-1}}$ | **-0.0122** | **-0.1039** | **-0.1652** | **-0.0027** | **-0.0264** | **-0.0633** | **-0.0081** | **-0.0396** | **-0.0817** |
| | (0.776) | (0.201) | (0.121) | (0.926) | (0.660) | (0.319) | (0.808) | (0.437) | (0.207) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0227** | **-0.0535** | **-0.1157** | **-0.0277** | **-0.0749** | **-0.1554** | **-0.0251** | **-0.0725** | **-0.1480** |
| | (0.534) | (0.549) | (0.124) | (0.512) | (0.596) | (0.160) | (0.526) | (0.577) | (0.137) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.3041** | **0.8236** | **0.6841** | **-0.5303** | **0.7927** | **0.0667** | **-0.8264** | **0.9372** | **0.1951** |
| | (0.552) | (0.582) | (0.665) | (0.397) | (0.580) | (0.971) | (0.381) | (0.648) | (0.942) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-1.7283**** | **-3.5650** | **-2.7634*** | **-3.5767**** | **-6.6135*** | **-5.2776*** | **-4.8676**** | **-8.9062*** | **-7.0087*** |
| | (0.016) | (0.123) | (0.090) | (0.038) | (0.057) | (0.058) | (0.027) | (0.060) | (0.070) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-1.2384***** | **-2.3573**** | **-2.6544***** | **-1.9932***** | **-2.9835***** | **-3.9530***** | **-2.4103***** | **-3.5605***** | **-4.6869***** |
| | (0.003) | (0.022) | (0.005) | (0.001) | (0.004) | (0.004) | (0.001) | (0.010) | (0.005) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.2311** | **0.2552** | **-0.3331** | **-0.4324** | **0.7625** | **-0.2772** | **-0.5546** | **0.8851** | **-0.3600** |
| | (0.452) | (0.708) | (0.647) | (0.407) | (0.490) | (0.815) | (0.386) | (0.509) | (0.797) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.0621** | **-0.0028** | **-0.0489** | **0.3805** | **-0.0211** | **0.1294** | **0.5521** | **-0.0540** | **0.0926** |
| | (0.468) | (0.989) | (0.844) | (0.335) | (0.975) | (0.905) | (0.357) | (0.959) | (0.955) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **0.2792***** | **0.5486*** | **0.4173** | **1.8955**** | **3.2594**** | **2.5445*** | **2.7170**** | **4.7827**** | **3.6898*** |
| | (0.009) | (0.066) | (0.118) | (0.029) | (0.031) | (0.070) | (0.022) | (0.038) | (0.077) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **0.0697**** | **0.1096** | **0.1313*** | **0.6721***** | **0.7743**** | **1.1467**** | **0.9212***** | **1.1298*** | **1.6013**** |
| | (0.011) | (0.177) | (0.094) | (0.002) | (0.046) | (0.013) | (0.002) | (0.056) | (0.014) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **0.0197** | **-0.0334** | **0.0088** | **0.1894** | **-0.3884** | **-0.0114** | **0.2607** | **-0.4706** | **0.0346** |
| | (0.287) | (0.415) | (0.791) | (0.377) | (0.404) | (0.980) | (0.354) | (0.437) | (0.952) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **-0.0038** | **-0.1193** | **-0.1144** | **-0.0332** | **-0.6097** | **-0.3088** | **-0.0760** | **-0.9782*** | **-0.6210** |
| | (0.879) | (0.156) | (0.167) | (0.860) | (0.154) | (0.615) | (0.790) | (0.084) | (0.468) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **-0.0170** | **-0.0112** | **-0.0445** | **-0.2061** | **-0.0049** | **-0.4553** | **-0.2679** | **-0.0350** | **-0.6068** |
| | (0.220) | (0.778) | (0.373) | (0.206) | (0.993) | (0.446) | (0.205) | (0.958) | (0.428) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **-0.0308***** | **-0.0507** | **-0.0908** | **-0.2990**** | **-0.4616** | **-0.8763** | **-0.3960**** | **-0.6171** | **-1.1587** |
| | (0.009) | (0.264) | (0.142) | (0.029) | (0.427) | (0.166) | (0.023) | (0.395) | (0.160) |
| $\boldsymbol{PPP_t}$ | | | | | | | | | |
| $\boldsymbol{STK_t}$ | **0.0449** | **-0.4416** | **-1.2377** | **0.0288** | **-0.3217** | **-0.9646** | **0.0133** | **-0.3843** | **-1.0700** |
| | (0.855) | (0.520) | (0.152) | (0.896) | (0.592) | (0.179) | (0.953) | (0.516) | (0.151) |
| $R^2$ within | 0.4372 | 0.1198 | 0.1562 | 0.4603 | 0.1225 | 0.1634 | 0.4574 | 0.1218 | 0.1614 |
| F-statistic | 8545.6762 | 457.2391 | 709.8012 | 3440.7314 | 415.9338 | 7491.7885 | 2685.3357 | 246.5365 | 2811.5659 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 |
| Observations | 248 | 248 | 248 | 248 | 248 | 248 | 248 | 248 | 248 |

Table N1.C. Results for the internally managed fixed income funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.2042** | **0.3733** | **0.4899**** | **0.2611** | **0.3715** | **0.4242**** | **0.2715** | **0.4982** | **0.6060***** |
| | (0.214) | (0.333) | (0.012) | (0.218) | (0.320) | (0.021) | (0.318) | (0.232) | (0.005) |
| $\boldsymbol{f(age_{i,t})}$ | **-0.0023** | **-0.0247***** | **-0.0269***** | **-0.0346** | **-0.1114** | **-0.1199**** | **-0.0414** | **-0.1907** | **-0.2201***** |
| | (0.905) | (0.008) | (0.000) | (0.789) | (0.300) | (0.047) | (0.832) | (0.182) | (0.008) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.2996***** | **-0.4111** | **-0.0710** | **-0.4092***** | **-0.6645** | **-0.1503** | **-0.4720***** | **-0.8195*** | **-0.2329** |
| | (0.001) | (0.145) | (0.345) | (0.007) | (0.120) | (0.255) | (0.003) | (0.087) | (0.112) |
| $\boldsymbol{Bull_{i,t}}$ | **0.2860***** | **-0.0283** | **-0.0599** | **0.3359***** | **0.0150** | **-0.0255** | **0.3662***** | **0.0066** | **-0.0275** |
| | (0.008) | (0.769) | (0.390) | (0.004) | (0.914) | (0.803) | (0.005) | (0.967) | (0.817) |
| $\boldsymbol{Size_{i,t-1}}$ | **-0.0617** | **0.0528** | **0.0229** | **-0.1316** | **0.1588** | **0.3131*** | **-0.1481** | **0.2055** | **0.3221*** |
| | (0.386) | (0.519) | (0.761) | (0.271) | (0.456) | (0.052) | (0.221) | (0.359) | (0.065) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0003** | **-0.0082**** | **-0.0043** | **0.0004** | **-0.0076*** | **-0.0054** | **0.0004** | **-0.0082*** | **-0.0056** |
| | (0.925) | (0.048) | (0.494) | (0.932) | (0.068) | (0.421) | (0.915) | (0.054) | (0.410) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0044** | **0.0258** | **-0.0029** | **-0.0052** | **0.0307** | **0.0033** | **-0.0051** | **0.0302** | **0.0023** |
| | (0.564) | (0.292) | (0.808) | (0.549) | (0.198) | (0.774) | (0.550) | (0.210) | (0.839) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.2268** | **0.0833** | **-0.2060** | **-0.3054** | **0.1644** | **-0.3377** | **-0.3772** | **0.1832** | **-0.6603** |
| | (0.373) | (0.825) | (0.668) | (0.448) | (0.788) | (0.687) | (0.508) | (0.839) | (0.613) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.1048** | **0.0635** | **-0.1389** | **-0.0498** | **0.2668** | **-0.1799** | **-0.0311** | **0.3628** | **-0.2700** |
| | (0.592) | (0.819) | (0.232) | (0.868) | (0.491) | (0.352) | (0.937) | (0.448) | (0.252) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.1641** | **0.0989** | **-0.0096** | **-0.2195** | **-0.0132** | **-0.2187** | **-0.2736** | **-0.0575** | **-0.3015** |
| | (0.163) | (0.590) | (0.934) | (0.226) | (0.962) | (0.204) | (0.232) | (0.868) | (0.172) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.1305** | **0.0514** | **0.0484** | **-0.1716** | **0.0474** | **-0.0049** | **-0.2074** | **0.0450** | **0.0041** |
| | (0.213) | (0.316) | (0.392) | (0.356) | (0.676) | (0.961) | (0.352) | (0.712) | (0.973) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.0304** | **-0.0332** | **0.0597** | **0.1142** | **-0.0484** | **0.3234** | **0.1617** | **-0.0826** | **0.5010** |
| | (0.520) | (0.717) | (0.646) | (0.579) | (0.892) | (0.556) | (0.611) | (0.881) | (0.557) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **-0.0015** | **-0.0344** | **-0.0007** | **-0.0347** | **-0.1649** | **0.0801** | **-0.0472** | **-0.2426** | **0.1151** |
| | (0.933) | (0.211) | (0.950) | (0.800) | (0.341) | (0.341) | (0.809) | (0.330) | (0.337) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **0.0120*** | **-0.0042** | **0.0022** | **0.0769** | **0.0746** | **0.1412*** | **0.1100** | **0.0915** | **0.1817*** |
| | (0.093) | (0.773) | (0.808) | (0.311) | (0.474) | (0.066) | (0.286) | (0.538) | (0.091) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **0.0074** | **-0.0058*** | **-0.0073** | **0.0535** | **-0.0071** | **0.0013** | **0.0751** | **-0.0130** | **-0.0090** |
| | (0.189) | (0.083) | (0.116) | (0.474) | (0.856) | (0.976) | (0.435) | (0.785) | (0.875) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **0.0028** | **-0.0021** | **-0.0015** | **0.0413** | **-0.0509** | **-0.1044**** | **0.0523** | **-0.0726** | **-0.1193*** |
| | (0.379) | (0.587) | (0.623) | (0.299) | (0.477) | (0.040) | (0.245) | (0.386) | (0.053) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.0106***** | **0.0270**** | **0.0129***** | **0.1024*** | **0.2490**** | **0.1021**** | **0.1400**** | **0.3427**** | **0.1497***** |
| | (0.004) | (0.017) | (0.003) | (0.068) | (0.042) | (0.029) | (0.027) | (0.028) | (0.010) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **-0.0052** | **0.0004** | **-0.0000** | **-0.0488** | **-0.0182** | **-0.0177** | **-0.0668** | **-0.0155** | **-0.0176** |
| | (0.152) | (0.916) | (0.994) | (0.232) | (0.637) | (0.595) | (0.198) | (0.759) | (0.689) |
| $\boldsymbol{PPP_t}$ | **-0.1171** | **0.1059** | **0.1864** | **-0.1056** | **0.0484** | **0.1246** | **-0.1085** | **0.0611** | **0.1410** |
| | (0.431) | (0.737) | (0.106) | (0.405) | (0.882) | (0.289) | (0.407) | (0.850) | (0.230) |
| $\boldsymbol{STK_t}$ | **-0.0610** | **0.0829** | **0.1005** | **-0.0590** | **0.0002** | **0.0233** | **-0.0605** | **0.0206** | **0.0482** |
| | (0.744) | (0.223) | (0.142) | (0.694) | (0.998) | (0.751) | (0.704) | (0.775) | (0.505) |
| $R^2$ within | 0.1892 | 0.0716 | 0.0635 | 0.1820 | 0.0645 | 0.0666 | 0.1840 | 0.0673 | 0.0677 |
| F-statistic | 42.7118 | 27.2247 | 32.6605 | 89.7991 | 24.1259 | 31.3783 | 102.4564 | 25.4871 | 31.0116 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 216 | 216 | 216 | 216 | 216 | 216 | 216 | 216 | 216 |
| Observations | 2296 | 2296 | 2296 | 2296 | 2296 | 2296 | 2296 | 2296 | 2296 |

Table N1.D. Results for the internally managed equity funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.0966** | **-0.1134** | **-0.0658** | **0.0169** | **-0.0877** | **-0.2725** | **-0.0308** | **-0.1438** | **-0.4315** |
| | (0.231) | (0.756) | (0.834) | (0.869) | (0.846) | (0.490) | (0.819) | (0.770) | (0.338) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0073** | **0.0124** | **0.0314*** | **0.0818** | **0.0441** | **0.2254** | **0.1119** | **0.0806** | **0.3312** |
| | (0.476) | (0.362) | (0.057) | (0.251) | (0.742) | (0.137) | (0.292) | (0.659) | (0.114) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.4235*** ** | **0.1806** | **0.0766** | **-0.3607*** ** | **0.2147** | **0.1282** | **-0.3366*** ** | **0.2388** | **0.1366** |
| | (0.000) | (0.137) | (0.395) | (0.002) | (0.308) | (0.433) | (0.006) | (0.331) | (0.483) |
| $\boldsymbol{Bull_{i,t}}$ | **0.2417*** ** | **0.3024** ** | **0.0681** | **0.3570*** ** | **0.5337** ** | **0.2327** | **0.4116*** ** | **0.6202** ** | **0.3013** |
| | (0.002) | (0.030) | (0.551) | (0.000) | (0.018) | (0.197) | (0.000) | (0.017) | (0.145) |
| $\boldsymbol{Size_{i,t-1}}$ | **-0.0171** | **-0.0327** | **0.0225** | **-0.0512** | **-0.1421** | **-0.0264** | **-0.0574** | **-0.1749** | **-0.0465** |
| | (0.394) | (0.622) | (0.667) | (0.197) | (0.209) | (0.713) | (0.209) | (0.177) | (0.585) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0002** | **0.0052** | **-0.0001** | **0.0002** | **0.0054** | **-0.0011** | **0.0002** | **0.0054** | **-0.0008** |
| | (0.883) | (0.221) | (0.981) | (0.898) | (0.222) | (0.772) | (0.869) | (0.215) | (0.818) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0002** | **0.0236*** ** | **0.0195*** ** | **-0.0008** | **0.0226*** ** | **0.0187*** ** | **-0.0007** | **0.0226*** ** | **0.0186*** ** |
| | (0.965) | (0.001) | (0.003) | (0.880) | (0.002) | (0.004) | (0.885) | (0.002) | (0.004) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.0710** | **0.0114** | **0.5026** | **0.1139** | **-0.3000** | **0.6098** | **0.1431** | **-0.5027** | **0.8250** |
| | (0.541) | (0.976) | (0.128) | (0.469) | (0.599) | (0.205) | (0.527) | (0.562) | (0.259) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.0422** | **-0.1324** | **0.0852** | **-0.0170** | **-0.2310** | **0.2091** | **-0.0312** | **-0.2206** | **0.3281** |
| | (0.663) | (0.660) | (0.739) | (0.901) | (0.635) | (0.599) | (0.865) | (0.724) | (0.535) |
| $\boldsymbol{p10\_15_{i,t}}$ | **-0.0582** | **-0.0939** | **0.2374** | **-0.0507** | **-0.2626** | **0.3694** | **-0.0796** | **-0.2964** | **0.4760** |
| | (0.413) | (0.535) | (0.140) | (0.668) | (0.311) | (0.158) | (0.607) | (0.337) | (0.136) |
| $\boldsymbol{p15\_20_{i,t}}$ | **-0.0283** | **-0.0767** | **0.0989** | **-0.0326** | **-0.2625** | **0.1324** | **-0.0441** | **-0.3084** | **0.1586** |
| | (0.442) | (0.459) | (0.249) | (0.607) | (0.162) | (0.399) | (0.570) | (0.154) | (0.392) |
| $\boldsymbol{f(age_{i,t})\cdot p0\_5_{i,t}}$ | **-0.0088** | **0.0591** | **-0.0324** | **-0.0446** | **0.2902** | **-0.2391** | **-0.0603** | **0.4337** | **-0.3566** |
| | (0.735) | (0.618) | (0.751) | (0.650) | (0.457) | (0.466) | (0.685) | (0.464) | (0.472) |
| $\boldsymbol{f(age_{i,t})\cdot p5\_10_{i,t}}$ | **0.0058** | **0.0051** | **-0.0071** | **0.0056** | **0.0324** | **-0.1567** | **0.0164** | **0.0354** | **-0.2155** |
| | (0.562) | (0.888) | (0.824) | (0.935) | (0.877) | (0.405) | (0.866) | (0.906) | (0.427) |
| $\boldsymbol{f(age_{i,t})\cdot p10\_15_{i,t}}$ | **0.0071** | **0.0092** | **-0.0111** | **0.0259** | **0.0987** | **-0.1494** | **0.0442** | **0.1273** | **-0.2042** |
| | (0.204) | (0.376) | (0.315) | (0.639) | (0.275) | (0.129) | (0.564) | (0.296) | (0.125) |
| $\boldsymbol{f(age_{i,t})\cdot p15\_20_{i,t}}$ | **0.0022** | **0.0105*** | **0.0001** | **0.0140** | **0.1205*** | **-0.0349** | **0.0213** | **0.1551*** | **-0.0448** |
| | (0.408) | (0.094) | (0.977) | (0.598) | (0.065) | (0.551) | (0.552) | (0.067) | (0.556) |
| $\boldsymbol{f(age_{i,t})\cdot Size_{i,t-1}}$ | **0.0006** | **0.0036** | **0.0004** | **0.0143** | **0.0610*** | **0.0203** | **0.0183** | **0.0801*** | **0.0292** |
| | (0.417) | (0.160) | (0.866) | (0.221) | (0.077) | (0.337) | (0.230) | (0.073) | (0.310) |
| $\boldsymbol{f(age_{i,t})\cdot Bear_{i,t}}$ | **-0.0045*** | **-0.0037** | **-0.0006** | **-0.0481** | **-0.0330** | **-0.0271** | **-0.0636** | **-0.0471** | **-0.0323** |
| | (0.063) | (0.562) | (0.917) | (0.136) | (0.700) | (0.757) | (0.116) | (0.665) | (0.767) |
| $\boldsymbol{f(age_{i,t})\cdot Bull_{i,t}}$ | **-0.0100*** ** | **-0.0152** ** | **-0.0118** ** | **-0.0989*** ** | **-0.1789** ** | **-0.1333** ** | **-0.1330*** ** | **-0.2341** ** | **-0.1759** ** |
| | (0.000) | (0.017) | (0.020) | (0.001) | (0.025) | (0.049) | (0.000) | (0.022) | (0.038) |
| $\boldsymbol{PPP_t}$ | **-0.0615** | **-0.1846** | **-0.2928** | **-0.0664** | **-0.1682** | **-0.2476** | **-0.0678** | **-0.1728** | **-0.2590** |
| | (0.500) | (0.555) | (0.315) | (0.408) | (0.589) | (0.390) | (0.413) | (0.581) | (0.371) |
| $\boldsymbol{STK_t}$ | **0.0002** | **-0.0981** | **-0.1302** | **-0.0050** | **-0.0544** | **-0.0706** | **-0.0062** | **-0.0624** | **-0.0866** |
| | (0.999) | (0.298) | (0.332) | (0.938) | (0.550) | (0.546) | (0.928) | (0.501) | (0.476) |
| $R^2$ within | 0.5100 | 0.0221 | 0.0292 | 0.5112 | 0.0248 | 0.0289 | 0.5112 | 0.0246 | 0.0295 |
| F-statistic | 175.8943 | 7.1548 | 19.9664 | 121.9133 | 7.3997 | 16.8549 | 128.2827 | 6.9886 | 15.5187 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 596 | 596 | 596 | 596 | 596 | 596 | 596 | 596 | 596 |
| Observations | 6417 | 6417 | 6417 | 6417 | 6417 | 6417 | 6417 | 6417 | 6417 |

Table N1.E. Results for the internally managed international equity funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.0883** | **-0.3213** | **-0.0077** | **-0.0128** | **-0.1416** | **-0.0909** | **-0.0925** | **-0.1860** | **-0.2409** |
| | (0.441) | (0.377) | (0.976) | (0.929) | (0.785) | (0.781) | (0.589) | (0.744) | (0.530) |
| $f(age_{i,t})$ | **0.0139** | **0.0118** | **0.0295*** | **0.1181*** | **-0.0189** | **0.1647** | **0.1687*** | **0.0072** | **0.2599** |
| | (0.157) | (0.432) | (0.081) | (0.083) | (0.902) | (0.255) | (0.094) | (0.972) | (0.199) |
| $Bear_{i,t}$ | **-0.3487***** | **0.1679** | **0.0093** | **-0.3018***** | **0.2261** | **0.0803** | **-0.2876**** | **0.2612** | **0.1139** |
| | (0.000) | (0.284) | (0.941) | (0.006) | (0.365) | (0.668) | (0.018) | (0.373) | (0.609) |
| $Bull_{i,t}$ | **0.2740***** | **0.2008** | **-0.0319** | **0.3943***** | **0.4543*** | **0.1368** | **0.4516***** | **0.5284*** | **0.2017** |
| | (0.001) | (0.145) | (0.760) | (0.000) | (0.066) | (0.347) | (0.000) | (0.064) | (0.241) |
| $Size_{i,t-1}$ | **-0.0077** | **-0.1177** | **-0.0453** | **-0.0317** | **-0.3145*** | **-0.1575** | **-0.0409** | **-0.3762*** | **-0.1961*** |
| | (0.710) | (0.224) | (0.477) | (0.424) | (0.077) | (0.123) | (0.387) | (0.060) | (0.095) |
| $Share_{i,t-1}$ | **-0.0005** | **0.0412**** | **0.0171** | **-0.0020** | **0.0427**** | **0.0146** | **-0.0017** | **0.0428**** | **0.0150** |
| | (0.903) | (0.023) | (0.140) | (0.618) | (0.023) | (0.239) | (0.675) | (0.022) | (0.217) |
| $ABIshare_{i,t-1}$ | **0.0020** | **0.0056** | **0.0143** | **0.0007** | **0.0014** | **0.0127** | **0.0008** | **0.0016** | **0.0130** |
| | (0.640) | (0.746) | (0.338) | (0.872) | (0.937) | (0.345) | (0.861) | (0.927) | (0.338) |
| $p0\_5_{i,t}$ | **0.1268** | **0.2362** | **0.8126** | **0.2028** | **-0.1526** | **0.9947** | **0.3034** | **-0.1202** | **1.5759** |
| | (0.368) | (0.632) | (0.100) | (0.311) | (0.842) | (0.138) | (0.320) | (0.913) | (0.120) |
| $p5\_10_{i,t}$ | **0.0348** | **0.1941** | **0.3998** | **0.0769** | **0.0445** | **0.5204** | **0.1069** | **0.1770** | **0.7863** |
| | (0.770) | (0.581) | (0.191) | (0.623) | (0.946) | (0.265) | (0.617) | (0.832) | (0.213) |
| $p10\_15_{i,t}$ | **0.0020** | **0.0706** | **0.4631**** | **0.0301** | **-0.1254** | **0.6796*** | **0.0507** | **-0.0686** | **0.9337**** |
| | (0.985) | (0.749) | (0.048) | (0.856) | (0.773) | (0.061) | (0.815) | (0.895) | (0.042) |
| $p15\_20_{i,t}$ | **0.0067** | **-0.1469** | **0.0178** | **0.0230** | **-0.5380** | **-0.1208** | **0.0395** | **-0.6120** | **-0.1130** |
| | (0.913) | (0.378) | (0.890) | (0.822) | (0.116) | (0.604) | (0.747) | (0.109) | (0.677) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **-0.0290** | **-0.0571** | **-0.1885** | **-0.1271** | **0.0602** | **-0.6448** | **-0.1856** | **0.0551** | **-1.0006** |
| | (0.491) | (0.706) | (0.217) | (0.381) | (0.903) | (0.168) | (0.395) | (0.940) | (0.155) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **-0.0011** | **-0.0248** | **-0.0432** | **-0.0370** | **-0.0443** | **-0.2659** | **-0.0510** | **-0.1146** | **-0.4169** |
| | (0.934) | (0.586) | (0.255) | (0.601) | (0.878) | (0.230) | (0.632) | (0.779) | (0.201) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **-0.0016** | **-0.0103** | **-0.0423**** | **-0.0272** | **0.0281** | **-0.3092**** | **-0.0365** | **0.0050** | **-0.4541**** |
| | (0.867) | (0.538) | (0.013) | (0.719) | (0.865) | (0.035) | (0.733) | (0.982) | (0.026) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0021** | **0.0153*** | **0.0028** | **-0.0205** | **0.2270**** | **0.0535** | **-0.0285** | **0.2851**** | **0.0597** |
| | (0.598) | (0.093) | (0.674) | (0.580) | (0.044) | (0.516) | (0.566) | (0.045) | (0.576) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0004** | **0.0077*** | **0.0036** | **0.0106** | **0.1164**** | **0.0626**** | **0.0150** | **0.1531**** | **0.0838**** |
| | (0.606) | (0.052) | (0.193) | (0.401) | (0.034) | (0.043) | (0.370) | (0.029) | (0.041) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **-0.0023** | **-0.0063** | **-0.0056** | **-0.0306** | **-0.0562** | **-0.0592** | **-0.0398** | **-0.0773** | **-0.0794** |
| | (0.418) | (0.451) | (0.389) | (0.396) | (0.556) | (0.478) | (0.382) | (0.534) | (0.455) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0104***** | **-0.0129*** | **-0.0113**** | **-0.1025***** | **-0.1773*** | **-0.1311*** | **-0.1382***** | **-0.2263*** | **-0.1719*** |
| | (0.001) | (0.058) | (0.027) | (0.006) | (0.069) | (0.073) | (0.004) | (0.067) | (0.059) |
| $PPP_t$ | **-0.1248** | **0.0965** | **-0.2501** | **-0.1251** | **0.0936** | **-0.2148** | **-0.1279** | **0.0923** | **-0.2235** |
| | (0.191) | (0.743) | (0.356) | (0.141) | (0.739) | (0.405) | (0.144) | (0.745) | (0.391) |
| $STK_t$ | **-0.1047** | **-0.1172** | **-0.1239** | **-0.0892** | **-0.0379** | **-0.0442** | **-0.0952** | **-0.0518** | **-0.0639** |
| | (0.229) | (0.316) | (0.320) | (0.160) | (0.708) | (0.692) | (0.160) | (0.611) | (0.576) |
| $R^2$ within | 0.4450 | 0.0207 | 0.0388 | 0.4459 | 0.0262 | 0.0394 | 0.4465 | 0.0255 | 0.0400 |
| F-statistic | 258.6443 | 7.7855 | 19.7963 | 89.8958 | 6.6436 | 12.9566 | 121.7960 | 6.4184 | 14.6109 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 327 | 327 | 327 | 327 | 327 | 327 | 327 | 327 | 327 |
| Observations | 3623 | 3623 | 3623 | 3623 | 3623 | 3623 | 3623 | 3623 | 3623 |

Table N1.F. Results for the internally managed UK equity funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.0937** | **-0.1363** | **-0.1769** | **0.0759** | **-0.2774** | **-0.5290** | **0.0716** | **-0.3357** | **-0.6990** |
| | (0.365) | (0.800) | (0.701) | (0.541) | (0.658) | (0.364) | (0.653) | (0.624) | (0.294) |
| $f(age_{i,t})$ | **-0.0033** | **0.0136** | **0.0365*** | **0.0239** | **0.1111** | **0.3020** | **0.0221** | **0.1525** | **0.4201** |
| | (0.790) | (0.499) | (0.092) | (0.755) | (0.508) | (0.133) | (0.850) | (0.520) | (0.130) |
| $Bear_{i,t}$ | **-0.5668*** | **0.2298*** | **0.1766** | **-0.4807*** | **0.2398** | **0.1473** | **-0.4513*** | **0.2565** | **0.1246** |
| | (0.000) | (0.084) | (0.223) | (0.000) | (0.275) | (0.479) | (0.000) | (0.318) | (0.608) |
| $Bull_{i,t}$ | **0.1947**** | **0.4345*** | **0.1886** | **0.3048***** | **0.6344*** | **0.3262** | **0.3561***** | **0.7335*** | **0.3947** |
| | (0.018) | (0.063) | (0.339) | (0.001) | (0.087) | (0.303) | (0.001) | (0.083) | (0.271) |
| $Size_{i,t-1}$ | **-0.0332** | **0.0530** | **0.1063** | **-0.0808** | **0.1131** | **0.2098**** | **-0.0774** | **0.1030** | **0.2047*** |
| | (0.259) | (0.416) | (0.120) | (0.159) | (0.275) | (0.033) | (0.212) | (0.384) | (0.075) |
| $Share_{i,t-1}$ | **0.0012** | **0.0020** | **0.0004** | **0.0017** | **0.0013** | **-0.0012** | **0.0016** | **0.0015** | **-0.0008** |
| | (0.298) | (0.757) | (0.949) | (0.274) | (0.828) | (0.818) | (0.271) | (0.811) | (0.874) |
| $ABIshare_{i,t-1}$ | **-0.0058** | **0.0320***** | **0.0214***** | **-0.0064** | **0.0319***** | **0.0208***** | **-0.0063** | **0.0318***** | **0.0206***** |
| | (0.399) | (0.004) | (0.010) | (0.375) | (0.003) | (0.009) | (0.383) | (0.003) | (0.009) |
| $p0\_5_{i,t}$ | **0.0137** | **-0.1817** | **0.1015** | **-0.0077** | **-0.4445** | **0.0227** | **-0.1102** | **-0.8868** | **-0.2515** |
| | (0.928) | (0.717) | (0.821) | (0.968) | (0.586) | (0.976) | (0.710) | (0.488) | (0.827) |
| $p5\_10_{i,t}$ | **-0.0773** | **-0.4259** | **-0.2562** | **-0.0799** | **-0.3704** | **-0.0510** | **-0.1350** | **-0.4042** | **-0.0425** |
| | (0.479) | (0.195) | (0.327) | (0.604) | (0.393) | (0.899) | (0.493) | (0.458) | (0.933) |
| $p10\_15_{i,t}$ | **-0.0966** | **-0.2056** | **-0.0260** | **-0.1332** | **-0.3476** | **0.0434** | **-0.2216** | **-0.4562** | **-0.0044** |
| | (0.264) | (0.216) | (0.884) | (0.292) | (0.209) | (0.886) | (0.161) | (0.155) | (0.990) |
| $p15\_20_{i,t}$ | **-0.0559** | **0.0257** | **0.1795** | **-0.1084** | **0.0411** | **0.3904*** | **-0.1591** | **0.0362** | **0.4417*** |
| | (0.277) | (0.809) | (0.119) | (0.223) | (0.832) | (0.085) | (0.149) | (0.866) | (0.081) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.0175** | **0.1531** | **0.1375** | **0.1017** | **0.5066** | **0.2801** | **0.1638** | **0.7968** | **0.4773** |
| | (0.622) | (0.326) | (0.298) | (0.461) | (0.376) | (0.579) | (0.440) | (0.365) | (0.537) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0071** | **0.0167** | **0.0250** | **0.0535** | **0.0015** | **-0.1058** | **0.0844** | **0.0243** | **-0.0985** |
| | (0.512) | (0.642) | (0.414) | (0.455) | (0.993) | (0.550) | (0.400) | (0.921) | (0.689) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0152***** | **0.0235**** | **0.0225**** | **0.1005**** | **0.1511** | **0.0074** | **0.1507**** | **0.2200*** | **0.0447** |
| | (0.006) | (0.035) | (0.038) | (0.049) | (0.104) | (0.941) | (0.030) | (0.074) | (0.731) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **0.0075*** | **0.0022** | **-0.0041** | **0.0708*** | **-0.0035** | **-0.1376*** | **0.0994*** | **-0.0005** | **-0.1679*** |
| | (0.081) | (0.656) | (0.498) | (0.067) | (0.955) | (0.075) | (0.058) | (0.995) | (0.081) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0007** | **-0.0003** | **-0.0036** | **0.0177** | **-0.0194** | **-0.0548*** | **0.0191** | **-0.0187** | **-0.0611** |
| | (0.461) | (0.912) | (0.156) | (0.227) | (0.543) | (0.052) | (0.300) | (0.646) | (0.105) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **-0.0059**** | **-0.0022** | **0.0051** | **-0.0642*** | **-0.0158** | **0.0350** | **-0.0840**** | **-0.0250** | **0.0498** |
| | (0.030) | (0.753) | (0.445) | (0.050) | (0.871) | (0.755) | (0.043) | (0.837) | (0.716) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0095***** | **-0.0174*** | **-0.0117** | **-0.0940**** | **-0.1758** | **-0.1226** | **-0.1262**** | **-0.2371** | **-0.1642** |
| | (0.008) | (0.075) | (0.141) | (0.022) | (0.160) | (0.247) | (0.018) | (0.132) | (0.215) |
| $PPP_t$ | **0.0683** | **-0.4172** | **-0.4069** | **0.0410** | **-0.4023** | **-0.3564** | **0.0438** | **-0.4039** | **-0.3659** |
| | (0.559) | (0.308) | (0.266) | (0.672) | (0.331) | (0.328) | (0.663) | (0.330) | (0.316) |
| $STK_t$ | **0.2057*** | **-0.1342** | **-0.1884** | **0.1675** | **-0.1192** | **-0.1365** | **0.1737** | **-0.1207** | **-0.1492** |
| | (0.085) | (0.493) | (0.331) | (0.110) | (0.446) | (0.384) | (0.107) | (0.467) | (0.367) |
| $R^2$ within | 0.6350 | 0.0539 | 0.0556 | 0.6331 | 0.0533 | 0.0533 | 0.6335 | 0.0537 | 0.0541 |
| F-statistic | 215.0657 | 22.2866 | 55.1449 | 67.3478 | 23.5072 | 149.4284 | 88.0467 | 24.9174 | 156.6593 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 264 | 264 | 264 | 264 | 264 | 264 | 264 | 264 | 264 |
| Observations | 2746 | 2746 | 2746 | 2746 | 2746 | 2746 | 2746 | 2746 | 2746 |

Table N2.A. Results for the externally managed all-funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | 0.0457 | -0.0378 | 0.6180*** | 0.0095 | -0.3436 | 0.3498 | -0.1007 | -0.6083 | 0.1044 |
| | (0.723) | (0.879) | (0.008) | (0.960) | (0.347) | (0.316) | (0.699) | (0.231) | (0.825) |
| $f(age_{i,t})$ | 0.0006 | 0.0277 | 0.0303 | 0.1328 | 0.3700* | 0.3415 | 0.1744 | 0.5386* | 0.4893 |
| | (0.973) | (0.278) | (0.255) | (0.329) | (0.095) | (0.143) | (0.374) | (0.098) | (0.150) |
| $Bear_{i,t}$ | -0.6144*** | -0.0249 | -0.1331* | -0.5907*** | -0.1213 | -0.1956 | -0.6102*** | -0.1561 | -0.2137 |
| | (0.000) | (0.483) | (0.080) | (0.000) | (0.129) | (0.190) | (0.000) | (0.152) | (0.257) |
| $Bull_{i,t}$ | 0.0213 | 0.0465 | -0.2168** | 0.0853 | 0.1192 | -0.1143 | 0.0884 | 0.1388 | -0.0791 |
| | (0.732) | (0.609) | (0.024) | (0.308) | (0.482) | (0.554) | (0.385) | (0.509) | (0.742) |
| $Size_{i,t-1}$ | 0.0815* | 0.1171* | 0.0747 | -0.1140 | 0.0575 | -0.0183 | -0.0602 | 0.0823 | 0.0062 |
| | (0.067) | (0.080) | (0.299) | (0.259) | (0.460) | (0.863) | (0.534) | (0.328) | (0.957) |
| $Share_{i,t-1}$ | 0.0016 | 0.0018 | 0.0009 | 0.0030*** | 0.0021 | 0.0011 | 0.0027*** | 0.0023 | 0.0012 |
| | (0.200) | (0.598) | (0.800) | (0.004) | (0.522) | (0.743) | (0.010) | (0.490) | (0.736) |
| $ABIshare_{i,t-1}$ | 0.0006 | 0.0038 | 0.0020 | 0.0001 | 0.0032 | 0.0012 | 0.0003 | 0.0032 | 0.0013 |
| | (0.409) | (0.231) | (0.351) | (0.836) | (0.246) | (0.458) | (0.702) | (0.247) | (0.444) |
| $p0\_5_{i,t}$ | -0.0029 | -0.0321 | -0.2104 | 0.1965 | 0.3762 | 0.0379 | 0.1585 | 0.4667 | 0.0193 |
| | (0.983) | (0.869) | (0.192) | (0.335) | (0.276) | (0.891) | (0.528) | (0.308) | (0.961) |
| $p5\_10_{i,t}$ | 0.0551 | 0.1040 | 0.0106 | 0.1922* | 0.3968 | 0.2474 | 0.2009 | 0.5507 | 0.3641 |
| | (0.503) | (0.614) | (0.936) | (0.084) | (0.172) | (0.225) | (0.100) | (0.149) | (0.211) |
| $p10\_15_{i,t}$ | 0.1295* | 0.1462 | 0.0216 | 0.2826** | 0.5139 | 0.3063 | 0.3032** | 0.6625 | 0.4171 |
| | (0.059) | (0.308) | (0.832) | (0.029) | (0.112) | (0.215) | (0.047) | (0.104) | (0.201) |
| $p15\_20_{i,t}$ | 0.1140** | 0.1183 | 0.0509 | 0.1892* | 0.3008 | 0.2549 | 0.2013 | 0.3414 | 0.3003 |
| | (0.046) | (0.242) | (0.521) | (0.095) | (0.169) | (0.181) | (0.148) | (0.185) | (0.196) |
| $f(age_{i,t})\cdot p0\_5_{i,t}$ | 0.0170 | 0.0146 | 0.0493* | 0.0144 | -0.1449 | -0.0195 | 0.0349 | -0.1738 | 0.0156 |
| | (0.165) | (0.441) | (0.056) | (0.832) | (0.314) | (0.889) | (0.718) | (0.389) | (0.939) |
| $f(age_{i,t})\cdot p5\_10_{i,t}$ | -0.0029 | -0.0268 | -0.0117 | -0.0247 | -0.2075* | -0.1677 | -0.0329 | -0.2833* | -0.2242 |
| | (0.687) | (0.106) | (0.519) | (0.404) | (0.084) | (0.146) | (0.423) | (0.092) | (0.173) |
| $f(age_{i,t})\cdot p10\_15_{i,t}$ | -0.0069 | -0.0204 | -0.0124 | -0.0590 | -0.2360* | -0.1861 | -0.0764 | -0.3167* | -0.2457 |
| | (0.218) | (0.146) | (0.310) | (0.186) | (0.084) | (0.128) | (0.217) | (0.087) | (0.142) |
| $f(age_{i,t})\cdot p15\_20_{i,t}$ | -0.0051 | -0.0074 | -0.0067 | -0.0346 | -0.1012 | -0.1210 | -0.0455 | -0.1238 | -0.1480 |
| | (0.303) | (0.356) | (0.411) | (0.478) | (0.233) | (0.168) | (0.484) | (0.256) | (0.192) |
| $f(age_{i,t})\cdot Size_{i,t-1}$ | -0.0026 | -0.0100*** | -0.0056 | 0.0534 | -0.0432 | -0.0050 | 0.0377 | -0.0593* | -0.0157 |
| | (0.387) | (0.003) | (0.205) | (0.169) | (0.120) | (0.894) | (0.369) | (0.077) | (0.734) |
| $f(age_{i,t})\cdot Bear_{i,t}$ | 0.0045 | 0.0045 | 0.0018 | 0.0066 | 0.0846* | 0.0542 | 0.0175 | 0.1063 | 0.0650 |
| | (0.350) | (0.454) | (0.807) | (0.878) | (0.083) | (0.427) | (0.766) | (0.126) | (0.493) |
| $f(age_{i,t})\cdot Bull_{i,t}$ | -0.0000 | -0.0027 | -0.0054 | -0.0344 | -0.0456 | -0.0728 | -0.0377 | -0.0582 | -0.0956 |
| | (0.994) | (0.746) | (0.550) | (0.490) | (0.531) | (0.431) | (0.568) | (0.559) | (0.441) |
| $PPP_t$ | -0.0584 | 0.0754 | -0.2866 | -0.1165 | 0.0274 | -0.3112* | -0.1114 | 0.0179 | -0.3175* |
| | (0.553) | (0.679) | (0.104) | (0.219) | (0.885) | (0.077) | (0.246) | (0.926) | (0.079) |
| $STK_t$ | 0.0367 | -0.2101 | -0.1917 | -0.0057 | -0.2446* | -0.2044 | -0.0060 | -0.2578* | -0.2150 |
| | (0.678) | (0.140) | (0.269) | (0.948) | (0.067) | (0.210) | (0.947) | (0.064) | (0.205) |
| $R^2$ within | 0.4632 | 0.0062 | 0.0372 | 0.4667 | 0.0110 | 0.0422 | 0.4654 | 0.0106 | 0.0416 |
| F-statistic | 1169.6077 | 28.4795 | 68.2666 | 11009.3136 | 63.6305 | 54.7377 | 5982.2223 | 64.8134 | 132.7994 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 3964 | 3964 | 3964 | 3964 | 3964 | 3964 | 3964 | 3964 | 3964 |
| Observations | 18624 | 18624 | 18624 | 18624 | 18624 | 18624 | 18624 | 18624 | 18624 |

Table N2.B. Results for the externally managed allocation funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.3058** | **-1.3812*** ** | **-0.5711** | **0.4427** | **-1.6282** ** | **-0.8584** | **0.3666** | **-1.7438** ** | **-1.0496** |
| | (0.390) | (0.006) | (0.274) | (0.367) | (0.015) | (0.203) | (0.524) | (0.045) | (0.176) |
| $\boldsymbol{f(age_{i,t})}$ | **-0.0206** | **-0.0141** | **0.0052** | **0.0219** | **0.2171** | **0.2698** | **0.0089** | **0.2605** | **0.3501** |
| | (0.406) | (0.768) | (0.897) | (0.896) | (0.510) | (0.296) | (0.971) | (0.602) | (0.369) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.7437*** ** | **0.2996*** ** | **-0.2319** ** | **-0.7654*** ** | **0.4241*** | **-0.2554** | **-0.7842*** ** | **0.5543*** | **-0.2007** |
| | (0.000) | (0.003) | (0.040) | (0.000) | (0.060) | (0.127) | (0.000) | (0.068) | (0.326) |
| $\boldsymbol{Bull_{i,t}}$ | **-0.0532** | **0.3351** | **-0.3320** ** | **-0.0441** | **0.5370** | **-0.3197** | **-0.0501** | **0.6663** | **-0.3272** |
| | (0.639) | (0.151) | (0.013) | (0.718) | (0.191) | (0.145) | (0.728) | (0.181) | (0.226) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0574** | **0.3296*** | **0.1074** | **-0.4021** | **0.2304** | **-0.1062** | **-0.2686** | **0.3528** | **0.0088** |
| | (0.679) | (0.087) | (0.540) | (0.244) | (0.653) | (0.802) | (0.424) | (0.490) | (0.984) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0003** | **0.0014** | **-0.0006** | **0.0064** | **0.0061** | **0.0028** | **0.0050** | **0.0053** | **0.0021** |
| | (0.963) | (0.892) | (0.945) | (0.374) | (0.618) | (0.763) | (0.456) | (0.655) | (0.820) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0030** | **0.0097** | **0.0074** | **0.0015** | **0.0087** | **0.0058** | **0.0021** | **0.0090** | **0.0062** |
| | (0.154) | (0.123) | (0.109) | (0.360) | (0.116) | (0.159) | (0.248) | (0.114) | (0.134) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.5056** | **-0.5961** | **-0.1762** | **-0.1094** | **-0.0592** | **0.4297** | **-0.2420** | **-0.4066** | **0.3143** |
| | (0.177) | (0.221) | (0.772) | (0.808) | (0.915) | (0.524) | (0.665) | (0.569) | (0.761) |
| $\boldsymbol{p5\_10_{i,t}}$ | **-0.3901*** | **-0.7400** ** | **-0.3025** | **-0.3994*** | **-0.8246*** | **-0.1253** | **-0.4394** ** | **-1.1055*** | **-0.1460** |
| | (0.080) | (0.040) | (0.449) | (0.084) | (0.069) | (0.783) | (0.048) | (0.070) | (0.799) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.0110** | **-0.1787** | **0.0493** | **0.2144** | **0.0328** | **0.5608** | **0.2419** | **0.0508** | **0.7072** |
| | (0.945) | (0.484) | (0.835) | (0.304) | (0.930) | (0.141) | (0.310) | (0.910) | (0.141) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.1331** | **0.3226** | **0.1999** | **0.2261** | **0.4532** | **0.5618*** | **0.2650** | **0.5535** | **0.6731*** |
| | (0.488) | (0.300) | (0.312) | (0.352) | (0.250) | (0.058) | (0.372) | (0.253) | (0.067) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.0577** | **0.1108** | **0.1003** | **0.0748** | **0.2567** | **-0.0009** | **0.1337** | **0.4526** | **0.0606** |
| | (0.234) | (0.222) | (0.487) | (0.620) | (0.338) | (0.998) | (0.563) | (0.278) | (0.931) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **0.0034** | **0.0372** | **0.0084** | **0.1224** ** | **0.3489** | **0.0082** | **0.1400** | **0.5118** | **0.0207** |
| | (0.772) | (0.309) | (0.787) | (0.038) | (0.168) | (0.964) | (0.108) | (0.171) | (0.938) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **-0.0208*** ** | **-0.0227** | **-0.0282*** | **-0.0873** | **-0.0799** | **-0.3142** ** | **-0.1215** | **-0.1060** | **-0.4160** ** |
| | (0.006) | (0.223) | (0.081) | (0.160) | (0.599) | (0.038) | (0.146) | (0.628) | (0.045) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **-0.0144** | **-0.0281** | **-0.0224** | **-0.0703** | **-0.1451** | **-0.2476** ** | **-0.1014** | **-0.2105** | **-0.3236** ** |
| | (0.162) | (0.164) | (0.109) | (0.336) | (0.263) | (0.026) | (0.334) | (0.263) | (0.037) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **-0.0019** | **-0.0123** | **-0.0049** | **0.1489** | **-0.0537** | **0.0312** | **0.1137** | **-0.1080** | **-0.0099** |
| | (0.816) | (0.309) | (0.551) | (0.197) | (0.756) | (0.815) | (0.368) | (0.576) | (0.948) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.0016** | **-0.0307** ** | **-0.0162** | **0.0254** | **-0.1697** | **-0.0357** | **0.0351** | **-0.2520** | **-0.0705** |
| | (0.741) | (0.041) | (0.113) | (0.537) | (0.208) | (0.681) | (0.530) | (0.175) | (0.558) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **-0.0021** | **-0.0264** | **-0.0002** | **-0.0085** | **-0.2075** | **0.0015** | **-0.0081** | **-0.2890** | **0.0030** |
| | (0.759) | (0.150) | (0.984) | (0.886) | (0.210) | (0.990) | (0.914) | (0.193) | (0.984) |
| $\boldsymbol{PPP_t}$ | **-0.0816** | **0.9866*** ** | **0.5628** | **-0.1746** | **0.8868** ** | **0.5558** | **-0.1590** | **0.8966** ** | **0.5620** |
| | (0.624) | (0.005) | (0.189) | (0.411) | (0.013) | (0.200) | (0.447) | (0.012) | (0.200) |
| $\boldsymbol{STK_t}$ | **0.2159** ** | **0.3000*** | **0.4450** ** | **0.1465** | **0.1782** | **0.3859** ** | **0.1493** | **0.1900** | **0.3893** ** |
| | (0.037) | (0.099) | (0.011) | (0.145) | (0.262) | (0.011) | (0.142) | (0.253) | (0.012) |
| $R^2$ within | 0.5621 | 0.1064 | 0.1594 | 0.5619 | 0.1031 | 0.1607 | 0.5581 | 0.1032 | 0.1593 |
| F-statistic | 4979.7664 | 216.8559 | 228.8303 | 10004.4592 | 128.0985 | 54.6815 | 10172.5112 | 138.8528 | 62.1945 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 283 | 283 | 283 | 283 | 283 | 283 | 283 | 283 | 283 |
| Observations | 1316 | 1316 | 1316 | 1316 | 1316 | 1316 | 1316 | 1316 | 1316 |

Table N2.C. Results for the externally managed fixed income funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.8609***** | **-1.2674** | **-0.8953** | **-0.7837*** | **-1.3527** | **-0.9157** | **-1.1425**** | **-2.0117** | **-1.3879** |
| | (0.002) | (0.251) | (0.321) | (0.057) | (0.308) | (0.377) | (0.044) | (0.235) | (0.306) |
| $\boldsymbol{f(age_{i,t})}$ | **0.0344** | **0.0874*** | **0.0611** | **0.3885** | **0.7302** | **0.5197** | **0.5556** | **1.0634** | **0.7595** |
| | (0.423) | (0.088) | (0.191) | (0.213) | (0.173) | (0.251) | (0.222) | (0.167) | (0.243) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.3739***** | **0.0987** | **0.2396*** | **-0.4199***** | **-0.3745** | **0.1269** | **-0.4653***** | **-0.6174** | **0.0521** |
| | (0.007) | (0.617) | (0.078) | (0.001) | (0.358) | (0.647) | (0.001) | (0.297) | (0.891) |
| $\boldsymbol{Bull_{i,t}}$ | **0.0917** | **0.2644** | **0.1527** | **0.3393***** | **0.7972**** | **0.5565*** | **0.4453***** | **1.1554**** | **0.8556**** |
| | (0.433) | (0.114) | (0.256) | (0.001) | (0.041) | (0.055) | (0.000) | (0.022) | (0.026) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.2542**** | **0.3454** | **0.2584** | **-0.1097** | **0.0208** | **0.0337** | **-0.0114** | **0.2715** | **0.1942** |
| | (0.036) | (0.125) | (0.214) | (0.710) | (0.932) | (0.896) | (0.971) | (0.261) | (0.502) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0070*** | **0.0035** | **0.0009** | **0.0067**** | **0.0027** | **0.0004** | **0.0067**** | **0.0027** | **0.0004** |
| | (0.058) | (0.573) | (0.855) | (0.035) | (0.606) | (0.917) | (0.036) | (0.610) | (0.919) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **0.0026*** | **0.0070***** | **0.0056**** | **0.0022** | **0.0060**** | **0.0046*** | **0.0024** | **0.0065***** | **0.0049*** |
| | (0.070) | (0.001) | (0.016) | (0.296) | (0.018) | (0.096) | (0.225) | (0.010) | (0.067) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.3972** | **0.7739** | **0.0793** | **0.6581** | **1.2792** | **0.2238** | **0.7516** | **1.4894** | **-0.0104** |
| | (0.313) | (0.431) | (0.924) | (0.255) | (0.390) | (0.862) | (0.357) | (0.444) | (0.995) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.5680***** | **0.5404** | **0.6806** | **0.7796***** | **0.6632** | **0.9261** | **1.0083***** | **0.7642** | **1.2478** |
| | (0.005) | (0.474) | (0.275) | (0.006) | (0.478) | (0.276) | (0.003) | (0.458) | (0.228) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.3136**** | **0.1495** | **0.3882** | **0.4511*** | **0.4032** | **0.7491** | **0.4806** | **0.4041** | **0.9313** |
| | (0.026) | (0.715) | (0.314) | (0.063) | (0.438) | (0.237) | (0.117) | (0.478) | (0.219) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.2148**** | **0.2331** | **0.2968** | **0.4101**** | **0.3838** | **0.5007** | **0.4969**** | **0.4965** | **0.6743** |
| | (0.026) | (0.532) | (0.300) | (0.023) | (0.537) | (0.328) | (0.030) | (0.480) | (0.252) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **-0.0079** | **-0.0101** | **0.1178** | **-0.0986** | **-0.2286** | **0.2859** | **-0.1515** | **-0.3670** | **0.4383** |
| | (0.902) | (0.914) | (0.380) | (0.732) | (0.676) | (0.632) | (0.729) | (0.653) | (0.631) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **-0.0707**** | **-0.0453*** | **-0.1032**** | **-0.2754***** | **-0.1094** | **-0.3759** | **-0.4140***** | **-0.1729** | **-0.5789** |
| | (0.016) | (0.057) | (0.016) | (0.006) | (0.514) | (0.145) | (0.005) | (0.431) | (0.113) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **-0.0074** | **-0.0022** | **-0.0396*** | **-0.0560** | **-0.0663** | **-0.2740** | **-0.0709** | **-0.0725** | **-0.3909** |
| | (0.574) | (0.885) | (0.065) | (0.588) | (0.520) | (0.162) | (0.620) | (0.616) | (0.146) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **-0.0202**** | **-0.0327***** | **-0.0425***** | **-0.1586*** | **-0.1552** | **-0.2367** | **-0.2130*** | **-0.2301** | **-0.3461*** |
| | (0.040) | (0.008) | (0.002) | (0.052) | (0.374) | (0.133) | (0.055) | (0.299) | (0.092) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **-0.0110** | **-0.0373***** | **-0.0249*** | **0.0737** | **-0.0635** | **-0.0362** | **0.0406** | **-0.1818*** | **-0.1122** |
| | (0.170) | (0.007) | (0.059) | (0.454) | (0.398) | (0.689) | (0.736) | (0.057) | (0.347) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.0113** | **0.0423** | **0.0149** | **0.0554** | **0.4277*** | **0.1079** | **0.0855** | **0.5801** | **0.1564** |
| | (0.102) | (0.204) | (0.394) | (0.347) | (0.083) | (0.486) | (0.301) | (0.109) | (0.476) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **-0.0180**** | **-0.0675***** | **-0.0570***** | **-0.2111**** | **-0.5573**** | **-0.4454***** | **-0.2776**** | **-0.7792***** | **-0.6302***** |
| | (0.027) | (0.001) | (0.001) | (0.010) | (0.011) | (0.007) | (0.012) | (0.007) | (0.005) |
| $\boldsymbol{PPP_t}$ | **0.0268** | **0.2192** | **0.1789** | **-0.1134** | **0.0531** | **0.0306** | **-0.1084** | **0.0640** | **0.0419** |
| | (0.896) | (0.654) | (0.655) | (0.525) | (0.912) | (0.931) | (0.556) | (0.893) | (0.907) |
| $\boldsymbol{STK_t}$ | **0.0709** | **0.2255** | **0.1666** | **0.0094** | **0.1512** | **0.0785** | **0.0043** | **0.1478** | **0.0795** |
| | (0.732) | (0.170) | (0.413) | (0.959) | (0.319) | (0.648) | (0.982) | (0.351) | (0.662) |
| $R^2$ within | 0.1325 | 0.0454 | 0.0582 | 0.1534 | 0.0565 | 0.0604 | 0.1492 | 0.0551 | 0.0606 |
| F-statistic | 1121.9757 | 124.2664 | 304.8750 | 296.4016 | 54.9307 | 111.8041 | 303.0209 | 62.0126 | 128.6297 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 489 | 489 | 489 | 489 | 489 | 489 | 489 | 489 | 489 |
| Observations | 2055 | 2055 | 2055 | 2055 | 2055 | 2055 | 2055 | 2055 | 2055 |

Table N2.D. Results for the externally managed equity funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.1689** | **0.2173** | **0.8857*** ** | **0.1581** | **-0.0257** | **0.6318** ** | **0.1346** | **-0.2129** | **0.4390** |
| | (0.204) | (0.267) | (0.001) | (0.282) | (0.906) | (0.026) | (0.402) | (0.433) | (0.203) |
| $\boldsymbol{f(age_{i,t})}$ | **-0.0101** | **0.0194** | **0.0268** | **0.0351** | **0.2550** ** | **0.2748** | **0.0326** | **0.3845** ** | **0.4014** |
| | (0.384) | (0.325) | (0.206) | (0.638) | (0.045) | (0.113) | (0.759) | (0.047) | (0.113) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.6895*** ** | **-0.1705*** ** | **-0.2255*** ** | **-0.7023*** ** | **-0.3006*** ** | **-0.2987** * | **-0.7462*** ** | **-0.3663*** ** | **-0.3301** |
| | (0.000) | (0.000) | (0.009) | (0.000) | (0.001) | (0.080) | (0.000) | (0.002) | (0.126) |
| $\boldsymbol{Bull_{i,t}}$ | **-0.0451** | **-0.0970** * | **-0.3319*** ** | **-0.0439** | **-0.1249** | **-0.2802** | **-0.0791** | **-0.1721** | **-0.2827** |
| | (0.463) | (0.080) | (0.001) | (0.540) | (0.188) | (0.155) | (0.324) | (0.165) | (0.257) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0347** | **0.0240** | **0.0055** | **-0.0973** | **-0.0162** | **-0.0493** | **-0.0612** | **-0.0341** | **-0.0623** |
| | (0.292) | (0.561) | (0.929) | (0.342) | (0.898) | (0.726) | (0.507) | (0.778) | (0.650) |
| $\boldsymbol{Share_{i,t-1}}$ | **0.0003** | **0.0021** | **0.0025** | **0.0022** | **0.0022** | **0.0022** | **0.0018** | **0.0027** | **0.0025** |
| | (0.851) | (0.726) | (0.646) | (0.230) | (0.697) | (0.694) | (0.320) | (0.638) | (0.649) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0002** | **0.0031** | **0.0015** | **-0.0005** | **0.0025** | **0.0009** | **-0.0004** | **0.0025** | **0.0009** |
| | (0.814) | (0.343) | (0.541) | (0.551) | (0.452) | (0.727) | (0.659) | (0.449) | (0.719) |
| $\boldsymbol{p0\_5_{i,t}}$ | **-0.0207** | **0.0129** | **-0.1798** | **0.1393** | **0.3449** * | **0.0091** | **0.1140** | **0.5025** * | **0.0509** |
| | (0.771) | (0.950) | (0.404) | (0.247) | (0.091) | (0.964) | (0.466) | (0.074) | (0.853) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.0141** | **0.1801** | **0.0011** | **0.1272** * | **0.4765*** ** | **0.2137** * | **0.1145** | **0.6781*** ** | **0.3301** * |
| | (0.752) | (0.300) | (0.994) | (0.087) | (0.008) | (0.083) | (0.140) | (0.005) | (0.052) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.0618** | **0.1288** | **-0.0378** | **0.1637** * | **0.4044** ** | **0.1471** | **0.1589** * | **0.5251** * | **0.2228** |
| | (0.108) | (0.276) | (0.663) | (0.057) | (0.049) | (0.260) | (0.085) | (0.056) | (0.207) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.0699** ** | **0.0485** | **-0.0219** | **0.1123** * | **0.1681** | **0.1235** | **0.1152** | **0.1717** | **0.1350** |
| | (0.025) | (0.536) | (0.652) | (0.091) | (0.186) | (0.117) | (0.174) | (0.285) | (0.212) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.0048** | **-0.0058** | **0.0264** | **-0.0018** | **-0.1990** * | **-0.0769** | **0.0078** | **-0.2657** | **-0.0747** |
| | (0.699) | (0.817) | (0.238) | (0.977) | (0.092) | (0.471) | (0.930) | (0.116) | (0.636) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **0.0016** | **-0.0323** * | **-0.0060** | **-0.0040** | **-0.2589*** ** | **-0.1633** ** | **-0.0011** | **-0.3613** ** | **-0.2158** * |
| | (0.804) | (0.072) | (0.687) | (0.878) | (0.009) | (0.043) | (0.977) | (0.012) | (0.071) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **-0.0015** | **-0.0130** | **-0.0043** | **-0.0205** | **-0.1816** | **-0.1211** | **-0.0228** | **-0.2414** | **-0.1552** |
| | (0.733) | (0.374) | (0.680) | (0.521) | (0.129) | (0.165) | (0.606) | (0.147) | (0.199) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **-0.0028** | **0.0012** | **0.0008** | **-0.0135** | **-0.0439** | **-0.0693** | **-0.0185** | **-0.0422** | **-0.0737** |
| | (0.485) | (0.873) | (0.908) | (0.710) | (0.493) | (0.248) | (0.708) | (0.625) | (0.349) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **-0.0006** | **-0.0047*** ** | **-0.0020** | **0.0408** | **-0.0214** | **0.0005** | **0.0313** | **-0.0169** | **0.0064** |
| | (0.733) | (0.005) | (0.569) | (0.282) | (0.598) | (0.991) | (0.407) | (0.692) | (0.904) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.0090** ** | **0.0118** * | **0.0058** | **0.0431** | **0.1277** ** | **0.0736** | **0.0691** | **0.1691** ** | **0.0932** |
| | (0.042) | (0.090) | (0.517) | (0.229) | (0.015) | (0.360) | (0.161) | (0.024) | (0.404) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **0.0070** * | **0.0103** | **0.0022** | **0.0269** | **0.0592** | **-0.0154** | **0.0473** | **0.0882** | **-0.0147** |
| | (0.062) | (0.124) | (0.825) | (0.463) | (0.236) | (0.876) | (0.326) | (0.210) | (0.913) |
| $\boldsymbol{PPP_t}$ | **-0.0173** | **0.0521** | **-0.3693** ** | **-0.0559** | **0.0357** | **-0.3685** ** | **-0.0521** | **0.0243** | **-0.3774** ** |
| | (0.839) | (0.772) | (0.046) | (0.478) | (0.844) | (0.041) | (0.515) | (0.894) | (0.041) |
| $\boldsymbol{STK_t}$ | **0.0741** | **-0.2540** ** | **-0.2294** | **0.0391** | **-0.2529** ** | **-0.2095** | **0.0402** | **-0.2704** ** | **-0.2246** |
| | (0.386) | (0.028) | (0.151) | (0.640) | (0.024) | (0.175) | (0.633) | (0.018) | (0.156) |
| $R^2$ within | 0.5719 | 0.0114 | 0.0553 | 0.5715 | 0.0161 | 0.0595 | 0.5712 | 0.0158 | 0.0592 |
| F-statistic | 696.4425 | 89.2812 | 80.1307 | 5970.0724 | 158.3321 | 59.9518 | 2641.4486 | 196.9188 | 69.1207 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 2975 | 2975 | 2975 | 2975 | 2975 | 2975 | 2975 | 2975 | 2975 |
| Observations | 14557 | 14557 | 14557 | 14557 | 14557 | 14557 | 14557 | 14557 | 14557 |

Table N2.E. Results for the externally managed equity funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | 0.0057 | -0.6781* | 0.5948 | -0.0544 | -1.2454** | 0.4327 | -0.2286 | -1.7232** | 0.3176 |
| | (0.984) | (0.055) | (0.260) | (0.846) | (0.032) | (0.503) | (0.470) | (0.041) | (0.680) |
| $f(age_{i,t})$ | 0.0255 | 0.0777* | 0.0109 | 0.1761 | 0.6744* | 0.1997 | 0.2710 | 0.9887* | 0.2670 |
| | (0.290) | (0.055) | (0.834) | (0.155) | (0.056) | (0.566) | (0.153) | (0.054) | (0.602) |
| $Bear_{i,t}$ | -0.8988*** | -0.1713* | -0.7615*** | -0.9229*** | -0.4661** | -1.0330*** | -0.9866*** | -0.6437** | -1.2595*** |
| | (0.000) | (0.098) | (0.000) | (0.000) | (0.021) | (0.001) | (0.000) | (0.015) | (0.003) |
| $Bull_{i,t}$ | 0.0623 | 0.4569 | -0.1958 | 0.1828* | 0.7873 | 0.0529 | 0.1893 | 0.8814 | 0.0378 |
| | (0.274) | (0.140) | (0.545) | (0.061) | (0.122) | (0.913) | (0.148) | (0.151) | (0.948) |
| $Size_{i,t-1}$ | 0.1544** | 0.3880* | 0.3401* | -0.0505 | 0.3265 | 0.2254 | -0.0273 | 0.4074 | 0.2798 |
| | (0.025) | (0.065) | (0.091) | (0.798) | (0.226) | (0.450) | (0.888) | (0.116) | (0.386) |
| $Share_{i,t-1}$ | 0.0023 | -0.0203* | -0.0060 | 0.0034 | -0.0108 | -0.0012 | 0.0031 | -0.0107 | -0.0020 |
| | (0.734) | (0.092) | (0.665) | (0.567) | (0.503) | (0.933) | (0.613) | (0.489) | (0.888) |
| $ABIshare_{i,t-1}$ | 0.0007 | 0.0140 | 0.0061 | -0.0013 | 0.0068 | -0.0015 | -0.0012 | 0.0069 | -0.0009 |
| | (0.866) | (0.231) | (0.574) | (0.765) | (0.454) | (0.887) | (0.771) | (0.462) | (0.929) |
| $p0\_5_{i,t}$ | 0.1653 | -0.5476 | -1.5240 | 0.0583 | -0.4761 | -1.8719** | 0.0874 | -0.4817 | -2.4976*** |
| | (0.462) | (0.557) | (0.125) | (0.796) | (0.490) | (0.025) | (0.729) | (0.520) | (0.006) |
| $p5\_10_{i,t}$ | 0.2394 | 0.2969 | -1.0432 | 0.1801 | 0.7039 | -1.2012* | 0.1721 | 1.0740 | -1.6257* |
| | (0.249) | (0.528) | (0.212) | (0.411) | (0.197) | (0.097) | (0.491) | (0.198) | (0.061) |
| $p10\_15_{i,t}$ | 0.1821 | 0.6420 | -0.2187 | 0.2108 | 1.0497** | -0.0229 | 0.2410 | 1.2886** | -0.0219 |
| | (0.221) | (0.123) | (0.731) | (0.259) | (0.013) | (0.970) | (0.286) | (0.011) | (0.977) |
| $p15\_20_{i,t}$ | 0.0375 | 0.3925 | -0.4190 | -0.0128 | 0.2898 | -0.8701* | -0.0534 | 0.2433 | -1.2103** |
| | (0.666) | (0.100) | (0.225) | (0.902) | (0.214) | (0.065) | (0.686) | (0.367) | (0.038) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | 0.0140 | 0.1402** | 0.2727*** | 0.0358 | 0.1154 | 0.8004*** | 0.0378 | 0.1519 | 1.2251*** |
| | (0.653) | (0.036) | (0.002) | (0.581) | (0.744) | (0.000) | (0.705) | (0.785) | (0.000) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | 0.0275 | -0.0113 | 0.1743** | 0.0486 | -0.4097 | 0.5196** | 0.0728 | -0.6082 | 0.8130** |
| | (0.158) | (0.861) | (0.029) | (0.539) | (0.354) | (0.039) | (0.515) | (0.350) | (0.025) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | 0.0048 | -0.0334 | 0.0191 | -0.0181 | -0.3004* | -0.0154 | -0.0295 | -0.4314* | -0.0148 |
| | (0.721) | (0.251) | (0.672) | (0.815) | (0.080) | (0.948) | (0.785) | (0.075) | (0.965) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | 0.0147 | 0.0038 | 0.0719*** | 0.0757 | 0.0929 | 0.5177*** | 0.1034 | 0.1290 | 0.7289*** |
| | (0.119) | (0.798) | (0.004) | (0.137) | (0.174) | (0.006) | (0.150) | (0.163) | (0.004) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | -0.0008 | -0.0313*** | -0.0098 | 0.0765 | -0.1415 | -0.0187 | 0.0738 | -0.1957* | -0.0433 |
| | (0.843) | (0.006) | (0.461) | (0.287) | (0.154) | (0.901) | (0.350) | (0.052) | (0.802) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | 0.0181** | 0.0295** | 0.0456** | 0.0860 | 0.3163*** | 0.3500** | 0.1246 | 0.4208*** | 0.4858* |
| | (0.046) | (0.047) | (0.033) | (0.254) | (0.003) | (0.046) | (0.252) | (0.005) | (0.052) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | 0.0039 | -0.0132 | 0.0124 | -0.0582 | -0.2486 | -0.1198 | -0.0629 | -0.3085 | -0.1116 |
| | (0.591) | (0.558) | (0.550) | (0.378) | (0.223) | (0.532) | (0.489) | (0.254) | (0.663) |
| $PPP_t$ | | | | | | | | | |
| $STK_t$ | -0.0756 | -0.2105 | -0.3061 | -0.0060 | -0.1148 | -0.2008 | -0.0213 | -0.1547 | -0.2249 |
| | (0.672) | (0.512) | (0.543) | (0.965) | (0.728) | (0.691) | (0.882) | (0.643) | (0.658) |
| $R^2$ within | 0.8153 | 0.1210 | 0.2966 | 0.8205 | 0.1535 | 0.3225 | 0.8198 | 0.1482 | 0.3186 |
| F-statistic | 1443.8194 | 614.9989 | 455.8180 | 85239.1685 | 2147.0361 | 2077.1566 | 66865.7468 | 1587.1394 | 1649.4255 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 | 178 |
| Observations | 664 | 664 | 664 | 664 | 664 | 664 | 664 | 664 | 664 |

Table N2.F. Results for the externally managed international equity funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **0.1913** | **-0.0036** | **0.9160**** | **0.1298** | **-0.3442** | **0.6643** | **0.0708** | **-0.6401** | **0.4325** |
| | (0.266) | (0.993) | (0.017) | (0.477) | (0.412) | (0.106) | (0.688) | (0.193) | (0.351) |
| $\boldsymbol{f(age_{i,t})}$ | **-0.0012** | **0.0309** | **0.0202** | **0.0839** | **0.4004**** | **0.3178*** | **0.1055** | **0.5743**** | **0.4394*** |
| | (0.925) | (0.188) | (0.353) | (0.216) | (0.013) | (0.050) | (0.300) | (0.017) | (0.066) |
| $\boldsymbol{Bear_{i,t}}$ | **-0.5390***** | **-0.3676***** | **-0.4743***** | **-0.5530***** | **-0.4879***** | **-0.5533***** | **-0.5907***** | **-0.5834***** | **-0.6223***** |
| | (0.000) | (0.002) | (0.000) | (0.000) | (0.002) | (0.000) | (0.000) | (0.002) | (0.001) |
| $\boldsymbol{Bull_{i,t}}$ | **0.0408** | **-0.0864*** | **-0.3242***** | **0.0368** | **-0.0763** | **-0.2419**** | **-0.0003** | **-0.1477** | **-0.2593** |
| | (0.489) | (0.069) | (0.000) | (0.572) | (0.310) | (0.047) | (0.997) | (0.195) | (0.115) |
| $\boldsymbol{Size_{i,t-1}}$ | **0.0776*** | **0.1210**** | **0.1086**** | **-0.0273** | **-0.0479** | **-0.1067** | **0.0102** | **-0.0151** | **-0.0583** |
| | (0.058) | (0.031) | (0.038) | (0.681) | (0.661) | (0.345) | (0.891) | (0.900) | (0.627) |
| $\boldsymbol{Share_{i,t-1}}$ | **-0.0019** | **0.0009** | **-0.0038** | **-0.0008** | **0.0017** | **-0.0025** | **-0.0010** | **0.0017** | **-0.0028** |
| | (0.457) | (0.911) | (0.658) | (0.752) | (0.837) | (0.773) | (0.671) | (0.832) | (0.750) |
| $\boldsymbol{ABIshare_{i,t-1}}$ | **-0.0001** | **0.0018** | **-0.0006** | **-0.0002** | **0.0012** | **-0.0012** | **-0.0002** | **0.0013** | **-0.0011** |
| | (0.922) | (0.690) | (0.854) | (0.811) | (0.777) | (0.724) | (0.854) | (0.763) | (0.748) |
| $\boldsymbol{p0\_5_{i,t}}$ | **0.0200** | **0.3177** | **-0.0805** | **0.1816** | **0.8691***** | **0.3041** | **0.1843** | **1.2357***** | **0.4205** |
| | (0.807) | (0.165) | (0.755) | (0.122) | (0.004) | (0.358) | (0.189) | (0.003) | (0.354) |
| $\boldsymbol{p5\_10_{i,t}}$ | **0.0604** | **0.2653** | **0.0790** | **0.1793*** | **0.6453***** | **0.3652*** | **0.1863*** | **0.8216***** | **0.4512*** |
| | (0.425) | (0.183) | (0.656) | (0.064) | (0.006) | (0.063) | (0.073) | (0.003) | (0.068) |
| $\boldsymbol{p10\_15_{i,t}}$ | **0.0851*** | **0.1225** | **-0.0304** | **0.1989**** | **0.4631**** | **0.1650** | **0.2103***** | **0.5359**** | **0.1737** |
| | (0.087) | (0.430) | (0.823) | (0.010) | (0.018) | (0.375) | (0.006) | (0.017) | (0.425) |
| $\boldsymbol{p15\_20_{i,t}}$ | **0.1324***** | **0.2000*** | **0.0926** | **0.1946***** | **0.3929**** | **0.2567***** | **0.2116***** | **0.4097**** | **0.2644**** |
| | (0.010) | (0.089) | (0.193) | (0.002) | (0.014) | (0.010) | (0.002) | (0.036) | (0.048) |
| $\boldsymbol{f(age_{i,t}) \cdot p0\_5_{i,t}}$ | **0.0032** | **-0.0606** | **-0.0029** | **-0.0332** | **-0.4751***** | **-0.1953** | **-0.0369** | **-0.6748***** | **-0.2545** |
| | (0.824) | (0.103) | (0.940) | (0.500) | (0.005) | (0.223) | (0.617) | (0.008) | (0.290) |
| $\boldsymbol{f(age_{i,t}) \cdot p5\_10_{i,t}}$ | **0.0006** | **-0.0167** | **-0.0034** | **-0.0301** | **-0.2630***** | **-0.1468*** | **-0.0358** | **-0.3484**** | **-0.1894** |
| | (0.927) | (0.375) | (0.850) | (0.348) | (0.007) | (0.073) | (0.448) | (0.014) | (0.131) |
| $\boldsymbol{f(age_{i,t}) \cdot p10\_15_{i,t}}$ | **-0.0024** | **0.0001** | **0.0055** | **-0.0429** | **-0.1647**** | **-0.0589** | **-0.0527** | **-0.1976**** | **-0.0595** |
| | (0.522) | (0.990) | (0.620) | (0.109) | (0.022) | (0.398) | (0.147) | (0.046) | (0.543) |
| $\boldsymbol{f(age_{i,t}) \cdot p15\_20_{i,t}}$ | **-0.0047** | **-0.0019** | **-0.0012** | **-0.0371** | **-0.0883** | **-0.0706** | **-0.0497** | **-0.0980** | **-0.0774** |
| | (0.131) | (0.818) | (0.876) | (0.127) | (0.212) | (0.258) | (0.131) | (0.302) | (0.360) |
| $\boldsymbol{f(age_{i,t}) \cdot Size_{i,t-1}}$ | **-0.0017** | **-0.0060**** | **-0.0024** | **0.0246** | **0.0162** | **0.0531** | **0.0125** | **0.0046** | **0.0407** |
| | (0.245) | (0.037) | (0.480) | (0.220) | (0.615) | (0.188) | (0.618) | (0.911) | (0.402) |
| $\boldsymbol{f(age_{i,t}) \cdot Bear_{i,t}}$ | **0.0076** | **0.0186*** | **0.0131** | **0.0402** | **0.1517*** | **0.1091** | **0.0623** | **0.2098*** | **0.1495** |
| | (0.102) | (0.062) | (0.215) | (0.234) | (0.057) | (0.222) | (0.196) | (0.062) | (0.231) |
| $\boldsymbol{f(age_{i,t}) \cdot Bull_{i,t}}$ | **0.0072*** | **0.0154*** | **0.0044** | **0.0315** | **0.0595** | **-0.0209** | **0.0530** | **0.1014** | **-0.0131** |
| | (0.053) | (0.056) | (0.617) | (0.286) | (0.396) | (0.805) | (0.190) | (0.289) | (0.908) |
| $\boldsymbol{PPP_t}$ | **-0.1053** | **0.2534** | **-0.3299** | **-0.1326** | **0.2250** | **-0.3657** | **-0.1297** | **0.2182** | **-0.3664** |
| | (0.342) | (0.358) | (0.206) | (0.210) | (0.399) | (0.139) | (0.227) | (0.420) | (0.145) |
| $\boldsymbol{STK_t}$ | **-0.0790** | **-0.4997**** | **-0.3959***** | **-0.1031** | **-0.4994**** | **-0.4066***** | **-0.1036** | **-0.5176***** | **-0.4175***** |
| | (0.479) | (0.019) | (0.007) | (0.330) | (0.011) | (0.006) | (0.334) | (0.010) | (0.005) |
| $R^2$ within | 0.5169 | 0.0503 | 0.1005 | 0.5178 | 0.0573 | 0.1080 | 0.5174 | 0.0568 | 0.1068 |
| F-statistic | 1682.5932 | 70.8619 | 189.6098 | 766.3768 | 49.7631 | 231.6894 | 1389.8427 | 65.4620 | 228.2318 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 | 1565 |
| Observations | 7938 | 7938 | 7938 | 7938 | 7938 | 7938 | 7938 | 7938 | 7938 |

Table N2.G. Results for the externally managed UK equity funds sample. The PPB is the benchmark. The panel observations have a yearly frequency. The results are obtained using Driscoll-Kraay standard errors and fund fixed effects. P-values are in parentheses (* p<0.1, ** p<0.05, *** p<0.01).

| $f(age_{i,t})$ | | $age_{i,t}$ | | | $\ln(age_{i,t}+1)$ | | | $\sqrt[3]{age_{i,t}}$ | |
|---|---|---|---|---|---|---|---|---|---|
| Dependent | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 | Sharpe | $R_{Fund}$-$R_{PPB}$ | M2 |
| ***Constant*** | **-0.1613** | **0.8253*** | **1.0299***** | **-0.1316** | **0.7290** | **0.8193*** | **-0.1301** | **0.7265*** | **0.7004** |
| | (0.317) | (0.071) | (0.006) | (0.526) | (0.137) | (0.056) | (0.576) | (0.088) | (0.115) |
| $f(age_{i,t})$ | **-0.0210** | **0.0014** | **0.0407** | **0.0040** | **0.0089** | **0.1734** | **-0.0200** | **0.0533** | **0.2852** |
| | (0.115) | (0.969) | (0.182) | (0.966) | (0.948) | (0.387) | (0.879) | (0.811) | (0.337) |
| $Bear_{i,t}$ | **-0.7981***** | **0.0555** | **0.0921** | **-0.7574***** | **-0.0751** | **0.0366** | **-0.7554***** | **-0.1107** | **0.0363** |
| | (0.000) | (0.355) | (0.569) | (0.000) | (0.360) | (0.895) | (0.000) | (0.289) | (0.914) |
| $Bull_{i,t}$ | **-0.1161*** | **-0.1474** | **-0.3534**** | **-0.0852** | **-0.2870**** | **-0.3857** | **-0.0864** | **-0.3207**** | **-0.3886** |
| | (0.080) | (0.169) | (0.011) | (0.314) | (0.037) | (0.124) | (0.421) | (0.045) | (0.203) |
| $Size_{i,t-1}$ | **-0.0130** | **-0.1218** | **-0.1686*** | **-0.1791** | **0.0846** | **0.0234** | **-0.1353** | **-0.0019** | **-0.0603** |
| | (0.816) | (0.171) | (0.062) | (0.402) | (0.798) | (0.934) | (0.499) | (0.995) | (0.826) |
| $Share_{i,t-1}$ | **0.0053*** | **0.0108** | **0.0200**** | **0.0089***** | **0.0082** | **0.0150*** | **0.0081***** | **0.0097** | **0.0165*** |
| | (0.059) | (0.349) | (0.037) | (0.010) | (0.403) | (0.073) | (0.009) | (0.344) | (0.057) |
| $ABIshare_{i,t-1}$ | **-0.0007** | **0.0015** | **-0.0005** | **-0.0013** | **0.0022** | **-0.0002** | **-0.0010** | **0.0018** | **-0.0005** |
| | (0.596) | (0.468) | (0.872) | (0.367) | (0.292) | (0.938) | (0.461) | (0.364) | (0.817) |
| $p0\_5_{i,t}$ | **-0.1072** | **-0.3739** | **-0.1797** | **0.1014** | **-0.4106** | **-0.3756** | **0.0389** | **-0.4725** | **-0.3316** |
| | (0.330) | (0.196) | (0.469) | (0.601) | (0.203) | (0.136) | (0.880) | (0.316) | (0.359) |
| $p5\_10_{i,t}$ | **-0.0833** | **-0.0192** | **-0.0594** | **0.0589** | **0.1023** | **-0.0364** | **0.0099** | **0.3139** | **0.1581** |
| | (0.159) | (0.930) | (0.690) | (0.565) | (0.587) | (0.740) | (0.936) | (0.287) | (0.405) |
| $p10\_15_{i,t}$ | **0.0025** | **0.0879** | **-0.0330** | **0.0949** | **0.2031** | **0.0372** | **0.0511** | **0.3792** | **0.2029** |
| | (0.973) | (0.603) | (0.813) | (0.496) | (0.525) | (0.885) | (0.761) | (0.429) | (0.606) |
| $p15\_20_{i,t}$ | **-0.0274** | **-0.1298** | **-0.0631** | **0.0142** | **-0.0861** | **0.1071** | **0.0014** | **-0.0739** | **0.1757** |
| | (0.697) | (0.154) | (0.198) | (0.909) | (0.616) | (0.484) | (0.993) | (0.753) | (0.403) |
| $f(age_{i,t}) \cdot p0\_5_{i,t}$ | **0.0065** | **0.0375** | **0.0242** | **0.0280** | **0.1192** | **-0.0074** | **0.0530** | **0.1884** | **0.0049** |
| | (0.701) | (0.496) | (0.592) | (0.776) | (0.623) | (0.973) | (0.711) | (0.606) | (0.988) |
| $f(age_{i,t}) \cdot p5\_10_{i,t}$ | **0.0051** | **-0.0479** | **-0.0202** | **0.0301** | **-0.2286** | **-0.2178** | **0.0492** | **-0.3397** | **-0.3092** |
| | (0.551) | (0.130) | (0.426) | (0.489) | (0.172) | (0.136) | (0.435) | (0.169) | (0.149) |
| $f(age_{i,t}) \cdot p10\_15_{i,t}$ | **0.0029** | **-0.0303** | **-0.0172** | **0.0259** | **-0.1842** | **-0.1903** | **0.0431** | **-0.2748** | **-0.2692** |
| | (0.707) | (0.327) | (0.508) | (0.648) | (0.433) | (0.341) | (0.592) | (0.413) | (0.348) |
| $f(age_{i,t}) \cdot p15\_20_{i,t}$ | **-0.0006** | **0.0025** | **-0.0037** | **0.0067** | **-0.0257** | **-0.1473** | **0.0090** | **-0.0235** | **-0.1791** |
| | (0.920) | (0.807) | (0.680) | (0.899) | (0.799) | (0.170) | (0.902) | (0.864) | (0.205) |
| $f(age_{i,t}) \cdot Size_{i,t-1}$ | **0.0001** | **-0.0018** | **0.0003** | **0.0556** | **-0.0957** | **-0.0702** | **0.0446** | **-0.0711** | **-0.0437** |
| | (0.964) | (0.556) | (0.951) | (0.474) | (0.419) | (0.521) | (0.582) | (0.571) | (0.707) |
| $f(age_{i,t}) \cdot Bear_{i,t}$ | **-0.0014** | **0.0056** | **0.0020** | **-0.0235** | **0.0959*** | **0.0359** | **-0.0264** | **0.1212** | **0.0390** |
| | (0.789) | (0.258) | (0.810) | (0.627) | (0.077) | (0.721) | (0.686) | (0.100) | (0.773) |
| $f(age_{i,t}) \cdot Bull_{i,t}$ | **-0.0001** | **0.0047** | **0.0016** | **-0.0164** | **0.1011*** | **0.0275** | **-0.0170** | **0.1240*** | **0.0305** |
| | (0.987) | (0.396) | (0.850) | (0.785) | (0.053) | (0.789) | (0.833) | (0.077) | (0.825) |
| $PPP_t$ | **0.2719**** | **-0.5071**** | **-0.6047**** | **0.2087*** | **-0.5022**** | **-0.5342*** | **0.2141*** | **-0.5132**** | **-0.5475**** |
| | (0.047) | (0.046) | (0.027) | (0.056) | (0.030) | (0.051) | (0.056) | (0.030) | (0.049) |
| $STK_t$ | **0.3633***** | **0.0918** | **-0.0122** | **0.2969***** | **0.1107** | **0.0794** | **0.3025***** | **0.0970** | **0.0622** |
| | (0.000) | (0.797) | (0.967) | (0.003) | (0.718) | (0.768) | (0.002) | (0.758) | (0.822) |
| $R^2$ within | 0.6562 | 0.0323 | 0.0935 | 0.6552 | 0.0338 | 0.0936 | 0.6547 | 0.0330 | 0.0933 |
| F-statistic | 2917.2045 | 289.7548 | 76.1099 | 38489.6499 | 225.8305 | 176.9818 | 18343.5590 | 198.9827 | 155.6259 |
| p-value | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Funds | 1232 | 1232 | 1232 | 1232 | 1232 | 1232 | 1232 | 1232 | 1232 |
| Observations | 5955 | 5955 | 5955 | 5955 | 5955 | 5955 | 5955 | 5955 | 5955 |

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## Additional material


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